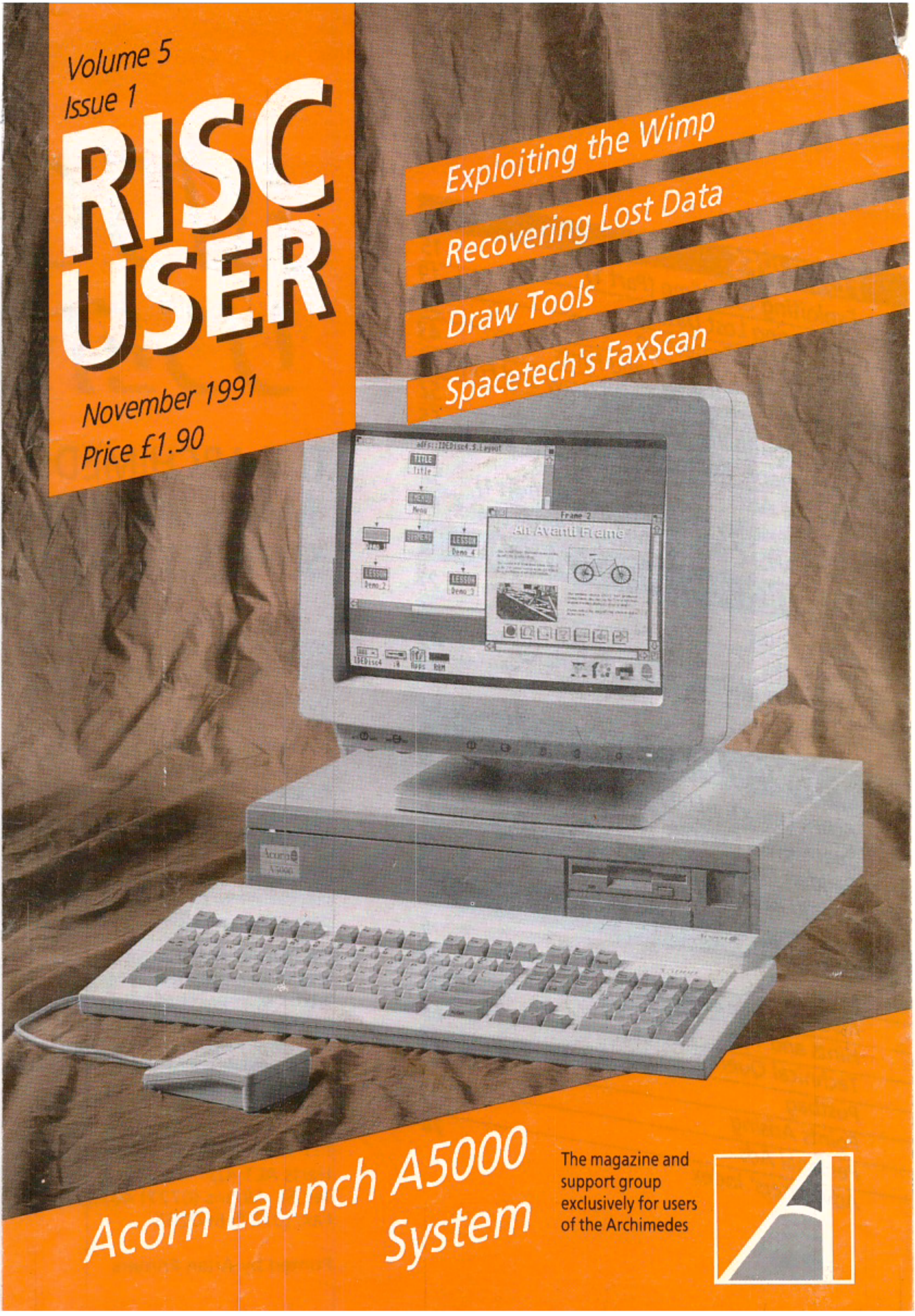
Volume 5
Issue 1

RISC USER

November 1991
Price £1.90

Exploiting the Wimp
Recovering Lost Data
Draw Tools
Spacetech's FaxScan



Acorn Launch A5000 System

The magazine and
support group
exclusively for users
of the Archimedes

ISSUE
1

VOLUME 5
NOVEMBER 1991

CONTENTS

FEATURES

Exploiting the Wimp (Part 1) 15
Recovering Lost Data 19
Simple Virus Protection 37
The 80 Column: News and Hints 43
WP/DTP: Cartography with Draw and Edit 45
PC Compatibility (Part 1) 52
C Notebook: News and Hints 55
Into the Arc: The Flexibility of the Archimedes (Part 1) 57
Using ANSI C (Part 5): Dialogue Boxes contd. 61

UTILITIES AND APPLICATIONS

Draw Tools 27
Fireworks 35
Extended Multi-Function Calculator 49
DeskStar 49

REVIEWS

Acorn Launch A5000 System 9
Spacetech's FaxScan 24
Baildon Electronics' Cross-32 Assembler 32
Render Bender II 40

REGULARS

News 5
RISC User Disc contents 38
Hints and Tips 66
Technical Queries 69
Postbag 71
Points Arising 71
Personal Ads 74
Advertisers' Index 74

RISC USER

THE ARCHIMEDES MAGAZINE AND SUPPORT GROUP

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Assistant Editor: Kristina Lucas
Technical Assistant: Mark Moxon
Production Assistant: Sheila Stoneman
Advertising: Sarah Shrive
Managing Editor: Sheridan Williams

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117 Hatfield Road, St Albans,
Herts AL1 4JS.
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Fax: (0727) 860263

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EDITORIAL

ACORN'S NEW A5000

Elsewhere in this issue we take a first look at Acorn's newly announced A5000. Not only is this new, high-powered machine aimed strongly at the middle of Acorn's current market range, but it is the first production model to feature the latest version of the RISC OS operating system.

There are several points which may be made about this announcement. The first is that the A5000 does offer the user an excellent specification at a price which is not at all unreasonable. But you can judge this for yourself after reading this month's overview.

Acorn has also chosen to make a small shift, but one I believe to be significant, in its overall strategy, and there are two strands to this in my view. The new system is very much a PC in appearance. Acorn seems to have decided that there is more merit in being seen as a PC competitor rather than a separate 'odd-ball'. But appearance is secondary to what a machine can do, and Acorn has strongly adhered to an evolution of RISC OS, albeit with enhanced DOS compatibility. RISC OS is what distinguishes the A5000 from the ranks of grey-faced PCs. The other small change is the emphasis on the A5000 as an Acorn computer, rather than as an Archimedes (with which it is entirely compatible).

Now I have always been somewhat puzzled by the fact that Olivetti, Acorn's major shareholder by a long way, has never appeared to show much interest in Acorn, and because Acorn seems never to have perceived much benefit, other than financial, in using Olivetti. Yet Olivetti is a well known multi-national company with a strong marketing organisation.

It seems to me that the A5000 is the best chance yet that Acorn has of achieving a much stronger international presence in the micro market. If this can be achieved by closer co-operation between Olivetti and Acorn that seems entirely sensible. However, I hope that Acorn has also learnt from its past forays into overseas markets, and will pursue such endeavours in a sober and rational way. The A5000 certainly deserves such success and recognition.

POLYGLOT

Our latest new product, from RISC Developments, is a multi-language facility called ***PolyGlot****. Its purpose is to make the use of foreign character sets as simple as possible, both in display and in printout. It is very flexible and customisable, with its use in education very much in mind, but it will be of interest to anyone who needs to work in a foreign language, regardless of the application (spreadsheet, word processor, DTP, database or whatever). Full details are given elsewhere in this issue.*

VOLUME 4 SPECIAL DISC

Our sought after ***Volume 4 Special Disc*** *is now available to RISC User readers only, at the special low price of £4.95 (inc. VAT) until 31st December 1991. As with the popular Volume 3 Special Disc, we have selected and updated the best applications, this time from Volume 4 of RISC User, together with a number of completely new and original items. Altogether there are over sixteen applications and other resources on the disc which once again offers tremendous value for the price. Full details of the contents are given elsewhere in this issue. Make sure you order your copy as soon as possible.*

VOLUME 4 INDEX

This is just a reminder that you should have received a complete printed index to the whole of volume four of RISC User with this issue.

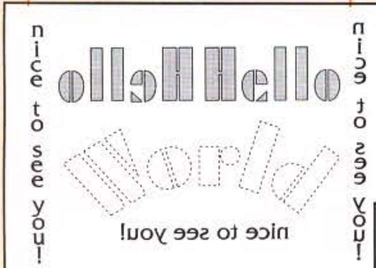
M.W.

RISC User Volume 4 Special Disc

This month we are celebrating the successful completion of the fourth year of publication of RISC User magazine and the start of volume 5. To mark this occasion we are launching a Volume 4 Special Disc with the first issue of Volume 5. The Special Disc contains a selection of the best programs published throughout the ten issues of Volume 4, updated where appropriate, plus a selection of new and specially written items.

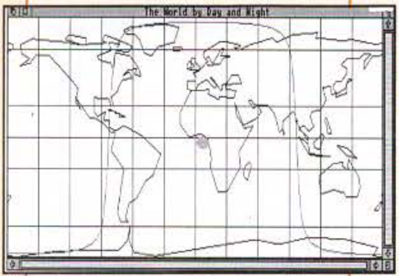
Converting Outline Fonts to Draw Files

A powerful application which you can use to add artistic flair to any DTP design. *DrawFont* enables text in an outline font to be converted into a standard Draw object and manipulated within Draw. You can produce some startling effects - text can be rotated, tilted, stretched or condensed, or you can choose to change the shape of individual letters.



World by Day and Night

Displays a map of the world with the position of the sun and areas of light and dark at any chosen time.



Disassembler

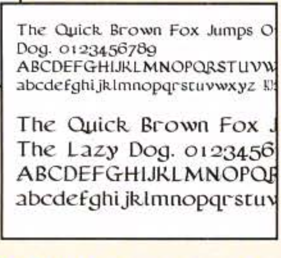
This useful Wimp program enables you to disassemble ARM code program files in a multi-tasking window.

Form Designer

An excellent application which makes the creation of printed forms and tables, or any blank forms, very easy indeed. It offers useful symbols and icons, template files and sprites, and when used in conjunction with a word processor or editor, will allow you to create any form quickly and effectively.

Inlay

Multi-tasking audio cassette inlay creator.



The Quick Brown Fox Jumps O
Dog. 0123456789
ABCDEFGHIJKLMNOPQRSTUVW
abcdefghijklmnopqrstuvwxyz

The Quick Brown Fox
The Lazy Dog. 0123456
ABCDEFGHIJKLMNOPQ
abcdefghijklmnopqrstu

New Fonts

A selection of outline fonts, including Wessex and Black Letters.

Super BackDrop

A very versatile implementation of the sticky backdrop concept, which allows you to stick file and directory icons onto the Desktop for quick access.

Yahtzee

A multi-tasking implementation of the traditional dice game.

Currency Converter

A short application which allows you to convert certain foreign currencies into pounds and vice versa.

Desktop Command Controller

A multi-tasking utility, which allows you to run operating system commands from the Desktop, i.e. select different sets of function key definitions, install modules and applications, or open directory windows with a single button press.

Monitor Saver

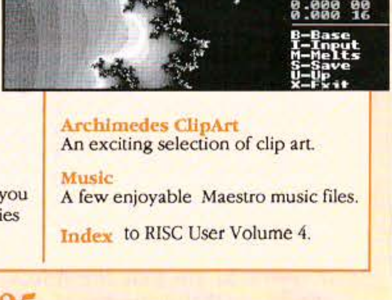
A very useful application which will display one of several changing patterns on the screen to prevent an otherwise fixed image from permanently damaging the screen. Choose your display from any one of: a sliding block puzzle, a floating real-time clock, rain drops, explosions and others.

Desktop Toilet

A novel application with appropriate sound effects allowing you to flush away any unwanted files.

Mandelbrot Plotter

A superfast Mandelbrot generator which uses Mariani's algorithm to produce a plot in under 2 seconds.



```
Old Values
xCoord
-3.2893E-1
yCoord
+7.6761E-1
Size
0.1537323
New Values
xCoord
-3.2893E-1
yCoord
+7.6761E-1
Size
0.1537323
Time
7.17
Melts/CR
0.000 00
0.000 16
B-Base
I-Input
M-Melts
S-Save
U-Up
X-Exit
```

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An exciting selection of clip art.

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A few enjoyable Maestro music files.

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NEW PRICES FOR ARCHIMEDES 400 SERIES

Following the announcement of Acorn's new A5000 system (see this issue for a first assessment of this powerful machine), Acorn has released details of new reduced prices for existing systems. The A410 will now cost £899.00 (down from £1099.00), the A420 £1099.00 (from £1299.00), and the A540 £2495.00 (from £2995.00). The A440 is now discontinued, while the prices of the entry level A3000 remains at £599.00. (all prices quoted ex. VAT). In comparing prices remember that the A5000 at £1499.00 ex. VAT includes a multi-sync monitor, but choice of monitor is an additional cost item for all other systems.

For more information contact your Acorn dealer (this includes Beebug) or Acorn Computers Ltd., Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN, tel. (0223) 245200.

COLTON RELEASES NEW PIPEDREAM

Colton Software has produced a new version of its popular Pipedream word processor and spreadsheet package. Colton claims that this is a major enhancement of Pipedream 3, and now includes built-in spreadsheet graphics, said to be superior to anything else on the market. The spreadsheet capabilities of Pipedream have also been substantially improved, and Pipedream now supports arrays and associated operations. An array reference can be stored in a single cell, and operations such as multiplying and then totalling a range of pairs of numbers becomes a simple matrix operation.

Scheduled for release at the BBC Acorn User Show, no details on price or expected upgrades were available when going to press. For more information contact Colton Software, 2 Signet Court, Swanns Road, Cambridge CB5 8LA, tel. (0223) 311881.

SING ALONG WITH THE ARC

Music specialist Electromusic Research has announced a Karaoke system for use with the Archimedes. With a choice of over 90 sets at £13.25 inc. VAT and p&p, each set contains 6 professional backing tracks on audio cassette plus software on disc. This scrolls the text on the screen in sync with the music which requires just any cassette player. EMR also sells a Karaoke unit with microphone, mixer and amplifier/speaker system to complement the Karaoke Performer for £69 inc. VAT. For more details contact EMR Ltd., 14 Mount Close, Wickford, Essex SS11 8HG, tel. (0702) 335747, fax (0702) 348406.

DEMISE OF MICRONET

Micronet, the computer hobbyist section of Prestel, which has always had a strong bias towards the Acorn market, is to cease operations with effect from the 31st October. Current Micronet subscribers will be offered free introductory membership of alternative CompuServe and £35 worth of free time. In recent years, Acorn's SID bulletin board has taken over the role once fulfilled by Micronet for most users of the Archimedes, and interest in Micronet has been waning for some time.

NUTS AND BOLTS OF CLIP ART

G.A.Herdman Educational has added *DTP_images 10* to its range of clip art. The latest collection *comprises* hardware (bolts, electrical, sockets, nuts and screws), *Industrial Processes* (electrolysis, distillation, etc.), *Musical* (piano, violin, etc.), *Scientific* (electric cells, expansion, etc.), and *Tools* (drill bits, hammer, spanner, pliers etc.). The disc containing 59 files (700K) costs £8.99 plus £1.50 p&p from G.A.Herdman Educational, 43 Saint Johns Drive, Clarborough, Retford DN22 9NN, tel./fax (0777) 700918.

MORE CLIP ART

A further collection of so-called line-art (all Draw files) is available from Southern Printers. The collection of 40 miscellaneous images covers insects, fruit, transport, buildings, and fun items. The collection costs £9.00 inclusive direct from Southern Printers, 47 Drake Road, Ashford, Kent TN24 0UZ, tel. (0233) 633919.

SILICON VISION

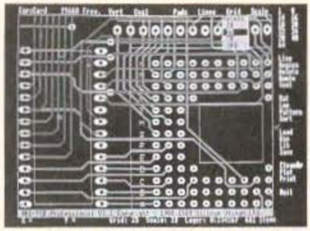
DESKTOP SOLUTIONS FOR THE ARCHIMEDES & BBC A3000

SolidTOOLS

The first fully integrated environment for 3D CAD, Photo-realistic rendering, Interactive animation, Texture mapping, Programmable animation and high resolution hardcopy to printers and plotters taking designers to new heights of design productivity and performance exceeding the capabilities of 'heavy-weight' packages on PC-compatibles and workstations which cost considerably more. The software provides 3D CAD facilities for Architectural, Engineering and Interior design offering a turnkey solution satisfying all your conceptual design and presentation requirements.

"Puts Silicon Vision at the top of the CAD market"
- A&B Computing November 1990.

ARC-PCB Schematics



The ultimate Electronic design package providing both circuit drawing and pcb layout in one design interface for a fully integrated system that surpasses all other PCB design systems in features & speed of operation for the fastest turnaround from concept to finished board design.
Features include Component schematics, Free-form circuit drawing, Automatic routing, Rats-nesting, Multiple-layers, Oval, Circular & Surface mount Pads, Component Pulling, On-line Help, Digital & Analogue tracks and up to 300,000 components. Take the lead for your PCB designs before your competitors do.

"Performs up to professional standards. Most comprehensive available on any micro"
- BBC Acorn User February 1989.

RiscBASIC

The best BASIC V compiler money can buy. Features include an optimising compiler, relocatable modules with multiple star commands, Window-based or command line compilation environment, standalone code generation, in-line assembler with powerful floating point mnemonic extensions and a Desktop developers environment from a leading Software House renowned for technical excellence.

"If you are looking for THE compiler to go for, and are confused about which one deserves to win the very public battle that has been raging in the advertisements, well my preference is for RiscBASIC"
- RISC USER August 1989.

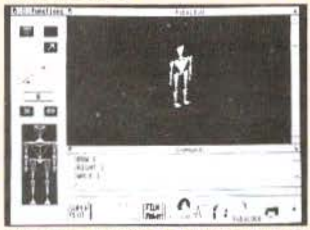
"very useful indeed for development work...produced significantly more efficient code" - Micro User July 1989.

SolidsRENDER

The most advanced Ray Tracing package for the Archimedes producing photo-realistic images of designs taking into account multiple colour light sources, reflections, shadows, transparencies, refractions and textures for the highest quality pictures from the leading 3D graphics experts renowned for technical excellence. The high-speed ray tracer provides anti-aliasing for smooth edges, motion blur effects, and variable camera lens for wide angle and telephoto effects.

"SolidsRENDER offers the most comprehensive and advanced object properties ... the fastest ray-tracer ... outputting the highest quality images"
- A&B Computing November 1990.

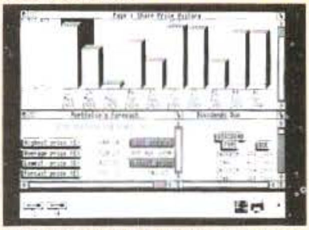
RoboLOGO



This new extension to traditional LOGO, provides three dimensional control of an articulated humanoid or animal figure based on the standard LOGO language. Natural commands such as 'Walking', 'Turning', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure which is readily understood by students using LOGO as an introduction to computing. The traditional Turtlegraphics & 3D Glider features are also supported for students to further explore their school work.

"Takes turtlegraphics and LOGO programming into a new dimension. The things that the robot can do are only limited by imagination!" - Educational Computing April 1991.

ShareHolder



The complete share holder's management system providing all the facilities needed to automate your portfolio. Features include Company statistics, Share holdings, Transaction processing, Portfolio history, Forecasts, Dividends due, Share price updates plus built-in Calendar, Calculator and Hardcopy facilities for total integration.

"An excellent concept, the first professional share related package for the archimedes ... well thought through ... remarkably comprehensive."
- Archimedes World March 1991.

All RISC OS software run in native mode on all Archimedes Computers & BBC A3000 with 1 Mbytes.

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Product Catalogue

For more details on these and other software products in our range please enquire for a free copy of Silicon Vision's 'Desktop Solutions' product catalogue.

• News • News • News • News

CHRISTMAS FLAVOURED CLIP ART

Another company joining the clip art roller coaster is Sherston Software Ltd. with a three disc collection of Draw files on a Christmas theme. The 70 images include food and drink, decorations, greetings, people, animals, trees, reindeer and sleighs, all intended for use in Christmas cards, party invitations, menus, advent calendars etc. The pack also includes a 24 page booklet which tells you all you need to know about Draw to use the clip art, and a series of activity cards. *Christmas Allsorts*, as the collection is called costs £16.95 ex. VAT from Sherston Software Ltd., Swan Barton, Sherston, Malmesbury, Wilts SN16 0LH, tel. (0666) 840433, fax. (0666) 840048.

GRAPHBOX PROFESSIONAL

For comprehensive data presentation, Minerva Software has announced *GraphBox Professional*, a completely rewritten development from Minerva's popular GraphBox application. The new package offers over 30 graph types including line graphs, bubble, scatter and bar charts, kite diagrams, pie charts, polynomial plots, polar charts, isometric and orthogonal surface charts, and more besides.

GraphBox Professional also includes many tools for controlling and customising chart displays to the user's requirements. GraphBox Professional costs £129.00 ex. VAT, and existing users of Minerva's GraphBox will be entitled to a discount of £35.00 off the above price if they trade this in for the new package. More details are available from Minerva Software, Minerva House, Baring Crescent, Exeter EX1 1TL, tel. (0392) 437756, fax (0392) 421762.

CAD A MUST FROM LINGENUITY

Lingenuity has announced a new professional quality PCB and Schematic designer called CadMust. Both applications are fully multi-tasking RISC OS applications with a very comprehensive specification. Output uses standard Acorn printer drivers, and a Gerber plotter driver will be available shortly. The CadMust PCB and Schematic package costs £539.00 ex. VAT. For those who just want to 'look' there is a demo version available for £5.00 plus VAT, refundable against purchase of the full package.

Lingenuity has also released AIM II, the latest version of the immensely powerful image processing package which originates from The University of Delft in the Netherlands. AIM II can enhance images from a wide range of sources, including the Wild Vision Hawk range. AIM II costs just £25.00 ex. VAT including 1 100 page manual.

For more information on both products contact Lingenuity at Wood Farm, Linstead Magna, Halesworth, Suffolk IP19 0DU, tel. (098685) 477, fax (098685) 460.

MOVING HOUSE

Carvic Manufacturing, originators of *DrawAid* reviewed in RISC User Volume 4 Issue 8 has now moved to Moray Park, Findhorn Road, Forres, Moray, Scotland IV36 0TP. As a consequence of our review, Carvic now includes an Introductory Tutorial with DrawAid.

Longman Logotron is now at 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS, tel. (0223) 425558, fax (0223) 425349. Longman Logotron has also released a version of Control Logo for the Archimedes for £22.00 ex. VAT.

ALL FORMATS FAIRS

Further All Formats Computer Fairs have been organised as follows:

3rd Nov	Royal Horticultural Hall, Westminster
10th Nov	National Motorcycle Museum, Solihull
1st Dec	City HAll, Candleriggs, Glasgow
14th Dec	University of Leeds Sports Centre, Calverley Street, Leeds
15th Dec	The Brunel Centre, Bristol Old Station (next to Temple Meads)

ovation

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Price ***£99.00*** Exc. VAT

Features include:

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- *fast spelling checker (needs 2Mb)*
- *variable views • headers/footers*
- *font size 1-1000pt • master pages*
- *import draw & sprite files*
- *full colour support • linked frames*
- *multiple columns • stylesheets*
- *definable frame borders*
- *auto hyphenation (needs 2Mb)*
- *find & replace • line drawing*
- *cut, copy, paste via clipboard*
- *dot-matrix & laser printer drivers*

Please write or phone for a full specification.

The package includes a 250 page user guide for novices and experienced users, a quick reference card, 7 outline fonts, and a range of clipart.

C Development System for the Archimedes & A3000

The C development system is a **complete C language** at an incredible price. It is ideal for beginners, but may be used by experienced C programmers to develop large applications.

The package includes a **multi-tasking editor** from which programs may be compiled and executed without leaving the desktop. In fact you can compile, link and run C programs at the press of a key.

The **compiler** is quick, easy-to-use and generates ARM code which may be linked to other programs using the **linker**. Compiler errors are automatically highlighted in the editor for easy correction.

The package includes a 200 page user guide, editor, compiler, linker and library of functions. Requires 1MB RAM and single floppy drive only.

A comprehensive range of Acorn compatible **RISC OS functions** is included, allowing complete WIMP applications to be written. New libraries of functions may be created, or functions added to the existing libraries using the built-in **library manager**.

Price ***£77.39*** Exc. VAT

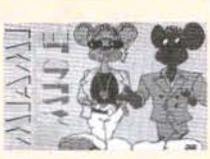
Hard Disc Companion

This is a reliable and easy-to-use hard disc archiver, which effortlessly backs up your hard disc (either all of it or just the latest changes) onto floppy discs. In the event of a hard disc failure you can confidently recover all your files. You can also restore individual files from the backup at any time - useful if you accidentally delete a file. Other features include:

- Full & incremental backups
- Automatic reminder
- Individual file restore
- Ignore files/directories
- File compression
- Full restore
- Verify whilst archiving
- 'Spark' file archiver

Price ***£33.91*** Exc. VAT

Star Colour Printer Driver



This RISC OS printer driver was developed in conjunction with Star Micronics for their excellent range of colour printers.. It gives superb results on both 9 and 24-pin printers, and is ideal for all applications that use RISC OS printer drivers. It is a Release 2 driver, supporting various print resolutions and 'fancy' text printing, and is suitable for the following range of printers:

- Star LC24-200 colour
- Star XB24-10 colour
- Epson JX compatible
- Star LC-200 colour
- Star LC-10 colour
- Epson LQ & SQ colour

Price ***£15.00*** Exc. VAT.

The official Star Micronics printer driver.

Quality software for the Archimedes and A3000

RISC developments

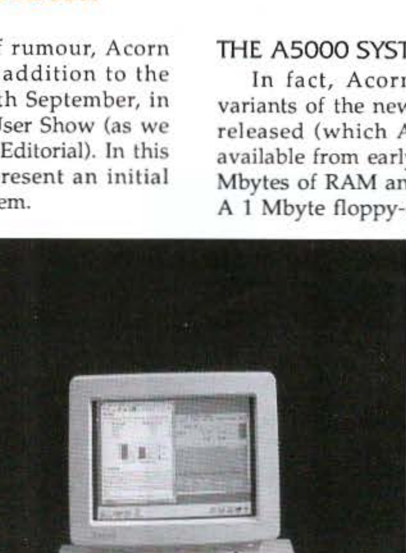
These products are available from all good dealers

RISC Developments Ltd. 117 Hatfield Road, St. Albans, Herts. AL1 4JS **Tel:** 0727 40303 **Fax:** 0727 860263

Acorn Launch A5000 System

Mike Williams takes a first look at a new breed of Archimedes, the recently announced A5000.

After many months of rumour, Acorn launched the latest addition to the Archimedes range on 27th September, in time for the BBC Acorn User Show (as we suggested in last month's Editorial). In this issue of RISC User we present an initial assessment of the new system.



Acorn's new A5000 is different in a number of significant ways from previous models in the Archimedes range. First of all, it will be badged and marketed as an Acorn machine, not as an Archimedes, though it is still firmly part of the Archimedes family. Secondly, the classic three-box design (of keyboard, computer and monitor) has undergone a major facelift (compared with the previous A300 and A400 series), and has a new and distinctive look to it. Thirdly, and in the long term of greatest importance, the A5000 is the first production computer from Acorn to be supplied with RISC OS 3 as its standard operating system.

This month we shall be looking at the A5000 as a complete system, and assessing its likely impact on the Acorn market. We shall also be taking an overview of the major extensions and enhancements to RISC OS. Acorn claims that this version involves over 300 significant improvements compared with the existing version of RISC OS. A more detailed appraisal of specific features will follow in future issues, and we shall then assess the implications for existing users who may be considering upgrading.

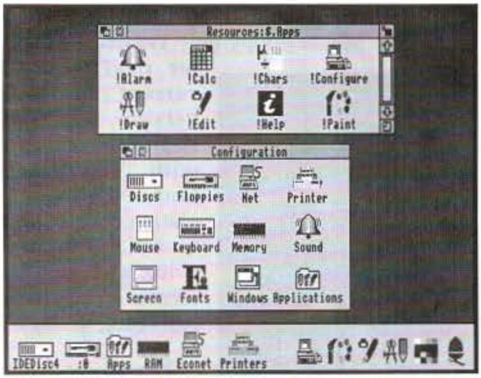
THE A5000 SYSTEM

In fact, Acorn has announced two variants of the new system. The first to be released (which Acorn promises will be available from early October) comes with 2 Mbytes of RAM and a 40 Mbyte hard disc. A 1 Mbyte floppy-only system is projected for next year. The current 2 Mbyte version is also supplied complete with an Acorn branded high resolution colour monitor at an all inclusive price, a change from Acorn's previous marketing strategy.

The keyboard is a standard Archimedes style unit but without a keystrip holder as used with the top level A540, and carrying A5000 and Acorn badges. This uses the familiar and standard PC layout, and is supplied with a 1.5m coiled cable for plugging into the *rear* of the new system box. The mouse plugs into the rear of the keyboard as before.

The main system unit is 100mm high by 430mm wide by 340mm deep. It is thus wider (from left to right) and shallower (from front to back) than the A300, A400 series and the A540. The front facia is to a completely new, more unobtrusive style than before (which I much prefer), and in this respect the new system differs little from countless other micros (a factor which in a small way may help Acorn's acceptability in the professional and business markets).

The internally fitted 3.5" IDE hard disc is mounted to the left (when viewed from the front), with a single indicator LED. Provision is made to the right for up to two floppy disc drives mounted, vertically one above the other, though just one is supplied as standard. The main on-off switch is just to the right of the floppy drive position, and now, conveniently, controls both micro and monitor.



The ROM-Based resources and new Configuration window

Looking at the rear of the new machine, the power supply (rated 70 W continuous) is to the left, with various interface sockets (Printer, Serial, Econet, VGA, Stereo Sound, and Keyboard) arranged along the lower edge. Above these, there are four standard-width expansion slots (which will alternatively take two double-width cards) for fitting Acorn and third party expansion cards. There is also a follow through mains socket for powering the monitor. Provision has also been made for a future option which would allow a user to connect a PC keyboard in place of Acorn's own design.

Inside, the A5000 boasts an ARM3 processor running at 25 MHz sitting on a completely new design of motherboard. This accommodates 2 Mbytes of RAM which can be expanded to a total of 4 Mbytes. There is also on-board provision to retro-fit the forthcoming floating point accelerator chip (first announced for the A540), and scheduled for release in the first quarter of next year.

The multiscan monitor will support both the 16 and 256 colour VGA standard at a resolution of 640 by 480 pixels.

The whole system is visually very appealing, and with the built-in ARM3 processor it is also very powerful. Raw performance, as might be expected, is virtually the same as that of the top-of-the-range A540, and some three times faster than the current A400 series. It compares more than favourably with 386 and 486 based PC alternatives.

RISC OS 3

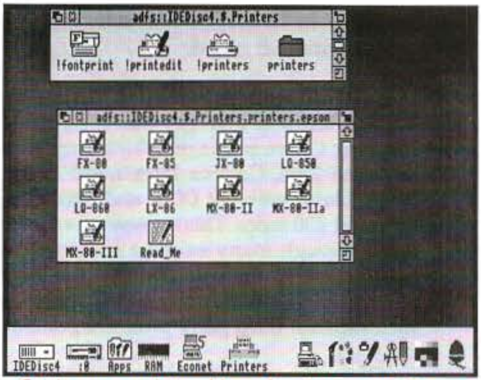
The A5000 is supplied with the latest version of Acorn's RISC OS operating system. Compared with version 2, RISC OS 3 has been enhanced and extended in many significant ways. All the major applications (like Edit and Draw) are now in ROM for fast, immediate access (see table 1). This also means that they require much less user RAM when operational. The applications themselves have been improved and extended, particularly Paint, Draw and Edit.

Paint	Pixel editor
Edit	Text editor
Draw	Object-based drawing
Alarm	Alarm clock
Calc	Desktop calculator
Configure	Machine configuration
Help	Interactive help system

Table 1. RISC OS 3 ROM-based applications

Edit now has a Print option, to be consistent with Draw and Paint; the search and replace facility has become much more powerful (and flexible); there is a menu option to change filetype, and options covering wordwrap and overwrite. Edit will now also accept Basic files, automatically converting them to text for editing, and resaving in tokenised Basic format.

Draw has been significantly improved with regard to text handling (partly via the new outline font manager). Text can now be edited, and text objects manipulated by applying transformations. Paint has a new initial dialogue box to make life easier for the user, and the colour and tools menus appear automatically.



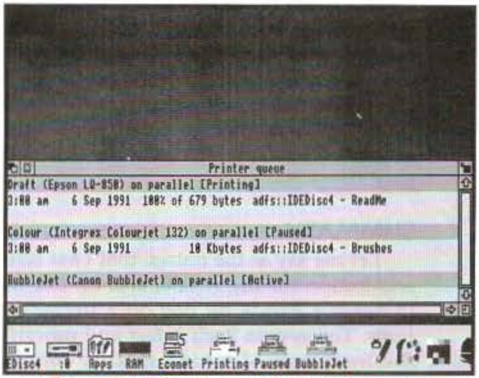
Setting up a printer driver showing current Epson support

The Alarm application has also been significantly improved, and can be used to initiate the running of applications at predetermined times, simply by dragging the application into the Alarm window. There is also a completely rewritten Configure application, which makes configuring your system much easier than before.

The Filer has been made much more multi-tasking, so that functions such as Copy, Delete, Move, Format and Verify can all be carried out in the background while other tasks are being performed. In addition, filetyping, timestamping and a new 'find file' command can all be given from the Desktop.

The ADFS has also been extended. Not only does it support the internally fitted IDE hard disc drive, but using a different disc controller chip it now allows 1.6 Mbytes of data to be stored on high density discs. It also recognises DOS format 360 Kbyte, 720 Kbyte, 1.2 Mbyte and 1.44 Mbyte discs, and Atari 360 Kbyte and 720 Kbyte disc formats. Place one of these discs in the drive, and a window can be displayed (as for an ADFS format disc), showing the root directory of the disc. DOS files can be dragged and accessed as for other files, (though the PC emulator is, of course, needed if you want to run DOS applications).

A revised version of the outline font manager is now provided as standard in ROM, together with 12 font styles, and new font families can be readily incorporated into the system. With the built-in fonts the need for font cache has been considerably reduced, a further memory saving. There is also a new application called FontPrint, which not only allows the user to relate the A5000's fonts to those used by any PostScript printer, but also permits any non-standard outline font to be downloaded to a PostScript printer, thus overcoming one of the major current limitations regarding the printing of outline fonts to such printers.



```
raft (Epson LQ-850) on parallel [Printing]
:00 am    6 Sep 1991  100% of 679 bytes  adfs::IDEDisc4 - ReadMe

Colour (Integrex Colourjet 132) on parallel [Paused]
3:00 am    6 Sep 1991            10 Kbytes  adfs::IDEDisc4 - Brushes

BubbleJet (Canon BubbleJet) on parallel [Active]
```

Example of three queued printer streams in operation

The printer driver system has also been completely rewritten, with a major part of the new system again in ROM. Selection and customisation of printer drivers has been made much easier, and more than one printer driver can be installed at the same time. This is not only useful for networked systems where more than one printer may be accessible, but also permits different logical printer drivers to be targeted to the same printer, allowing a choice between, say, draft and letter quality modes as required. Furthermore, each printer driver is fully queued, with comprehensive user control, and all printing effectively takes place in the background.

Lastly, in this roundup of features, the capabilities of the Desktop environment have been extended even further, yet control and use of the system is even easier than before: there are more options and far more of these can be controlled from the Desktop. The screen has also become a sticky backdrop, called a *Pinboard* by Acorn, permitting individual files and directories to be 'stuck' to the backdrop where they remain even when the parent directory viewer disappears. Directory viewers can be 'tokenised' into a miniature sprite, and also stuck to the Pinboard.

There is also a boot facility so that by using a simple Save box the details of the current Desktop display, including whatever applications are installed on the icon bar, can be saved, and the system rebooted to this state when next switched on. There are many other detailed enhancements to the Desktop, many as options (such as 3D effects for icons) which can selected by the user.

SUMMARY

Let me say at the outset, that I am full of admiration for the A5000, and cannot wait to get my hands on one on a permanent basis. The system itself is fast and powerful; the inclusion of a high quality monitor ensures that screen displays are to a high professional quality which does full justice to any software; and the advent of RISC OS 3 provides a wealth of features which are genuinely easy to use and to control. At its price, it has to be a runaway winner.

What of existing machines? We understand that the present A440 will be discontinued, and that there will be price reductions on the A410 and A420, but I cannot personally see these continuing for long. Within 12 months I would expect to see these completely replaced by an expanded A5000 series.

The A3000 will continue to provide excellent entry level capability for those who prefer its more compact nature and do not need a more expandable configuration, while Acorn say that the flagship A540 will continue to be targeted at the high performance market to which its expansion capability to 16 Mbytes and standard SCSI interface are well suited.

At the same time as launching the A5000, Acorn is also providing an A5000 Learning Curve package, which bundles in 1st Word Plus, Genesis Plus, multi-tasking PC Emulator with DR DOS, and Acorn DTP for about £30 more. This represents excellent value, though many existing users will no doubt wince at the continued promotion of Acorn DTP in particular when there are such superior third party products available.

Of course, many existing owners, apart from pondering the merits of trading in their existing system for an A5000, will want to know about the possibilities and merits in upgrading to RISC OS 3. For a start, Acorn says that this upgrade path will not be possible until sometime next year: the current version of RISC OS 3 only supports A5000 hardware, and will not work with A300 or A400 machines. At present we do not know the cost of any such upgrade, nor the extent to which the higher demands of RISC OS 3 will work satisfactorily with ARM2 machines. These are all issues which we shall be investigating in the future as information becomes available, and we are able to assess RISC OS 3 more fully.

For now, let us rest with the fact that Acorn has produced a remarkable system for the price. Let us hope for all our sakes that the rest of the computer world agrees.

Product	A5000 System
Supplier	Acorn Computers Ltd., Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN. Tel. (0223) 245200
Price	A5000 £1499 (ex. VAT) A5000 Learning Curve £1799 (inc. VAT)

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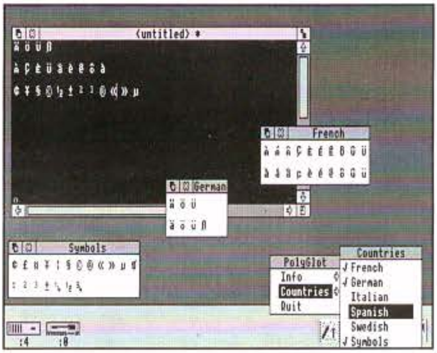
Select any of these characters with the mouse and it will automatically be inserted into your document.



Why PolyGlot is Better than any Other System

You can see all the characters you need in a window in both upper and lower case; you do not need keyboard overlays

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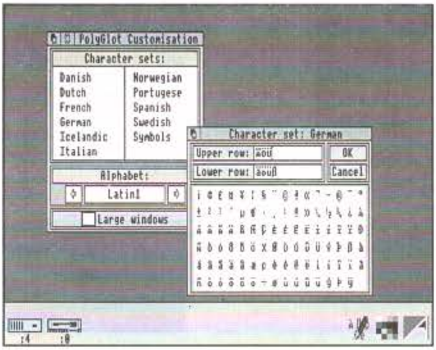
Each PolyGlot window can be displayed at one of two sizes.

Normal size displays the characters at the usual system font size (as for example filenames in directory viewers, or commands typed at the command line).

Large size shows the characters at approximately twice the normal size.



Upper row: äöü

Lower row: äöüß

Alphabet: Latin1

☐ Large windows

PolyGlot is Fully Customisable

You can tailor each individual copy of the application to your own specific requirements and include only those languages and characters, which you actually need.

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PolyGlot is available for £14.95 to members.
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Exploiting the Wimp

In this new series by Mike Ironmonger, we will be looking at a number of practical aspects of Wimp programming. We begin with some hints on loading window templates, and on indirected icon data.

INTRODUCTION

This series really continues where *Mastering the Wimp* left off, and will adopt a similarly practical approach. Breaking with tradition, however, the articles will no longer list complete programs or lines to add to previous programs. Instead I'll be presenting procedures and functions that you can include in your own programs.

They'll be written with a single but important assumption - the existence of a variable *block%* that points to a block of memory, the size of which is vital. It will be used (amongst other things) to store the definition of a window ,so it must be large enough to store the largest window definition. A window definition takes 88 bytes for the window itself and a further 32 bytes for each icon in the window. The block will only ever be used as a temporary store, so as long as you do the same, you can use it anywhere in your program.

WINDOW LOADING

In Volume 3 Issue 4 we presented a short program that loaded a single window from a template file. Although that was fine as a demonstration, it couldn't be easily extended to load several windows. To simplify the task of loading any number of windows from a template file I've written two routines.

The main routine (PROCload_templates) from which the window loading is controlled, should be called during initialisation i.e. between the call to "Wimp_Initialise" and the polling loop. It requires two parameters, *filename$* and *bytes%*. The first is the full filename of the template file. Using the actual filename (e.g. "$.!Test.Templates") is OK while you're developing an application. However, once the application is completed this should be changed to:

```
"<Obey$Dir>.Templates"
```

so that your application will run from any location in a disc's hierarchy.

The second variable, *bytes%*, is the number of bytes that are required for the indirected data of all the windows you're going to load. The procedure dimensions a block of this size, and as each window is loaded, the Window manager stores the indirected data in this block, and sets the indirect pointers in the window definition to point to this data. If the block isn't large enough, the error "Window definition won't fit" will occur. This will also leave the template file open, so you should include the call SYS "XWimp_CloseTemplate" in your error handler to close the template file.

Inside the procedure (as indicated in the listing) you should insert a call to the function FNcreate_window to load and create each window in turn. This function requires two parameters, *$name%* and *spr_area%*. The first is the name of the window (or Identifier as FormEd calls it), while the second is the sprite area pointer for the window. This can either be the address of a user sprite area created by you, or +1 for the Wimp's sprite pool, or 0 to indicate no sprite area.

The function calls "Wimp_Load Template" to load the window definition from the template file. It then sets the window's sprite area pointer, creates the window, and returns the window's handle.

INDIRECTED SPRITE-ONLY ICONS

Indirected sprite-only icons are a special case because they have their own sprite area pointer. This needs to be set before the window is created, which is what the procedure PROCload_window allows you to do. It's identical to FNcreate_window, except that it returns without creating the window. This leaves the window defintion at *block%*, and you should then set any icon sprite-area pointers appropriately, and call "Wimp_CreateWindow" to create the window.

MULTIPLE WINDOWS

One of the important features of most major RISC-OS applications is that they can operate on several 'objects' at once, each through its own window. Many applications can also display several views of one object through several identical windows. To achieve either of these, an applicaton needs to be able to create several copies of a single window. Using FormEd this requires a different approach to loading a window definition. Instead of loading the definition and creating the window in one move, we load the definition into a safe area of memory, and create each window as and when required using this definition. The function FNload_template does just this. It requires three parameters. The first two are as for FNcreate_window, while the third, *len%*, is the size of the window definition (88 bytes for the window, plus 32 bytes for each icon in the window).

The function first dimensions a block of memory to hold the window definition. It then calls "Wimp_LoadTemplate" to load the window definition into this block, sets the sprite area pointer, and returns the address of the block. You can then create a window as and when you require by calling "Wimp_CreateWindow" with the address of the block.

It's not quite as simple as this though, because you may want certain attributes to be different in different windows. For example, in a painting program each sprite editing window would have a different title and size. To do this you have to overwrite the appropriate words (see PRM) in the window definition block before you use it to create the window. You'll also have to dimension some memory if you require different indirected data in each window.

INDIRECTED DATA

Accessing and changing the indirected data of an icon is a vital part of most applications. When an indirected icon is created by a program, the address of its indirected data is obviously known to the program. When loading a window from a template file, a SYS call is required to find out the address.

The SYS call "Wimp_GetIconState" was described in Volume 3 Issue 6, and is used by the functions FNind_addr and FNval_addr. They both require two parameters - a window handle and an icon handle. As their names suggest, the first returns the address of the icon's indirected data, while the second returns the address of the icon's validation string.

In a similar vein, FNtitle_addr requires just a window handle, and uses the call SYS "Wimp_GetWindowInfo" to return the address of the window's indirected title.

All three of the above functions check that the relevant data is actually indirected, and generate an error if this is not the case.

One important point to note when changing an icon's data or a window's title data is that the change will not be reflected on screen until the relevant area is redrawn. I'll be explaining how to do this in the next article, along with other advice on redrawing in general, and a look at the SYS call "Wimp_PollIdle".

This month's disc contains an application which demonstrates the use of these functions and procedures.

The Wimp Programmer's Toolkit contains many programs which will be of interest to Wimp programmers, including a copy of Acorn's Template Editor.

```
REM          >Procedures
REM Exploiting the Wimp (Part 1)
REM Author    M.C. Ironmonger
REM RISC User November 1991
REM Program   Subject to Copyright
REM           Not Public Domain
:
DEF PROCload_templates(filename$,bytes%)
LOCAL iblock%,ind%,name%
DIM iblock% bytes%:ind%=iblock%
DIM name% 11
SYS "Wimp_OpenTemplate",,filename$
:
REM Insert calls here to:
REM "FNcreate_window"
REM "PROCload_window"
REM "FNload_template"
REM "FNcreate_iconbar_icon"
:
SYS "Wimp_CloseTemplate"
ENDPROC
:
DEF FNcreate_window($name%,spr_area%)
LOCAL handle%
SYS "Wimp_LoadTemplate",,block%,ind%,ibloc
  k%+bytes%,-1,name% TO ,,ind%
block%!64=spr_area%
SYS "Wimp_CreateWindow",,block% TO handle%
=handle%
:
DEF PROCload_window($name%,spr_area%)
SYS "Wimp_LoadTemplate",,block%,ind%,ibloc
  k%+bytes%,-1,name% TO ,,ind%
block%!64=spr_area%
ENDPROC
:
DEF FNload_template($name%,spr_area%,len%)
LOCAL tblock%
DIM tblock% len%-1
SYS "Wimp_LoadTemplate",,tblock%,ind%,iblo
  ck%+bytes%,-1,name% TO ,,ind%
tblock%!64=spr_area%
=tblock%
:
DEF FNind_addr(window%,icon%)
block%!0=window%
block%!4=icon%
SYS "Wimp_GetIconState",,block%
IF ((block%!24) AND &100)=0 ERROR 1,"Icon
  "+STR$icon%+" isn't indirected"
=block%!28
:
DEF FNval_addr(window%,icon%)
block%!0=window%
block%!4=icon%
SYS "Wimp_GetIconState",,block%
IF ((block%!24) AND &100)=0 ERROR 1,"Icon
  "+STR$icon%+" isn't indirected"
=block%!32
:
DEF FNtitle_addr(window%)
block%!0=window%
SYS "Wimp_GetWindowInfo",,block%
IF ((block%!60) AND &100)=0 ERROR 1,"Title
  isn't indirected"
=block%!76
```

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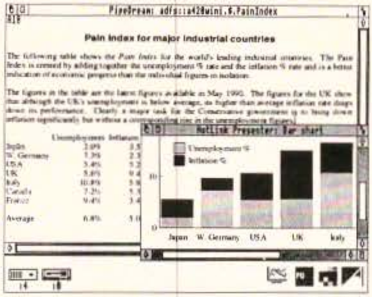

PipeDream: adfs::a420wini.$.PainIndex
Pain index for major industrial countries
HotLink Presenter: Bar chart
Unemployment %
Inflation %
10
0
Japan
W. Germany
USA
UK
Italy

The bar chart in the screen shown above was produced by using the HotLink between PipeDream 3 and HotLink Presenter.

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- display and printing of pictures within text
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- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream & BBC View Professional
- natural, background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Tab, CSV and Acorn DTP format files
- multi-field sorting
- 62 spreadsheet and database functions
- external references between documents for 3-D modelling
- macro file recorder
- slot protection

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Recovering Lost Data

Lee Calcraft looks at ways of recovering programs and data lost in the Desktop environment

In spite of the excellent ruggedness of the Arc's Desktop, it is still possible to lose programs, data or text when working within the Desktop environment. This can happen if you simply quit an application without saving your work, or more insidiously if your application suffers a rare fatal crash, or worse still, a serious bug in one application could cause the whole Desktop to crash.

At this point, you are likely to throw up your hands in horror, and start all over again; but in most cases it is possible to extract the lost data with very little effort. The key factor to remember, is that in almost all such cases, your data will still be somewhere in RAM - even if you have had to hit Ctrl-Reset to unfreeze the Desktop. Incidentally, if the Desktop does appear to hang, first try Escape (very unlikely to have any effect) - then Reset (the special button on the right-hand side of the A3000, or at the rear of the keyboard on the Archimedes). If this fails, finally use Ctrl-Reset. In the very very rare cases where this does not unfreeze your computer, you will have to switch off and on again - and this, of course will kill off all your data.

PRACTICAL RECOVERY

The following procedure should help you get out of most fixes. First of all, unfreeze your machine (if it has hung) using either Reset, or Ctrl-Reset (not Ctrl-Break). If you have Boot files which cause applications to be automatically loaded, hit Escape as soon as Reset has been released (or use Shift-Reset) to prevent applications from being installed. But if you are recovering from a Desktop which is still operational, you do not need to do this, and you can keep all currently running applications. The one exception to this is where the application from which you have lost data is still running. You should close down this task by the normal means.

The next step is to install a RAM search program - preferably in the form of a relocatable module. The RISC User Toolbox is excellent for this purpose, and at the extremely low price of £5.75 inc. VAT, it might be worth buying a copy ready for such an eventuality. Alternatively, Clares' Toolkit will do the job just as well. And even without these, the task is not impossible - so read on.

To load Toolbox, press F12 from the Desktop, and type something like:

```
*adfs::0.$.Toolbox
```

Now click Menu over the Task Manager, and allocate the maximum possible memory to the *Next* slot. This will cause the *Free* slot to drop to zero.

Next, press F12 to give you the operating system prompt, and type:

```
BASIC
```

This will put you into Basic with all the free memory available. This should include the part of RAM containing your lost data.

The way to proceed now depends on what you have lost. We will look at Basic programs first. This is only likely to be of interest in cases where you are entering or editing programs, since otherwise, you will have a disc copy of your program somewhere.

RECOVERING A BASIC PROGRAM

The first thing to do is simply to type:

```
OLD
```

If you are lucky, your program will be reinstated intact - just type:

```
LIST
```

to check it, and you can then save it as normal.

If the program which appears here is the wrong one - some other task perhaps - or you get the message *Bad program* in response to "OLD", you will need to proceed as follows.

The first thing to do is to locate the approximate whereabouts of your program in RAM. You can do this by performing a string search in RAM providing you know of some string contained in the program - for example the author's name or the name of the program. You will need a start address as well as the string to be searched. To get this, type:

```
PRINT ~PAGE
```

at the keyboard. The computer will print something like:

```
8F00
```

You should use this as the start address for any search. If you are using Toolbox to find a program containing the words "Copyright", you could type:

```
*SEARCHS 8F00 Copyright
```

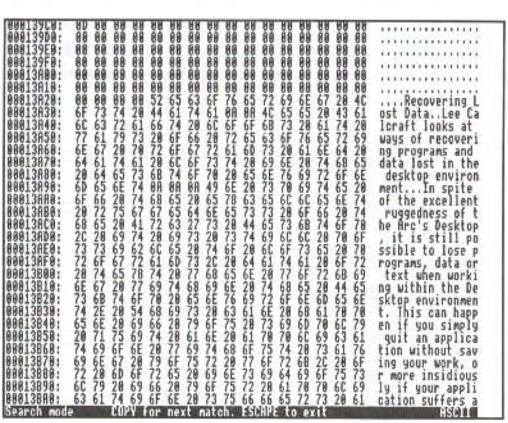
Remember that this is case sensitive - so if you are in doubt about the case of the first letter for example, just leave it off, and search for "opyright". Remember too that it is no good searching for Basic keywords such as ENDPROC etc. because these are stored in RAM in a tokenised form.

The word "Copyright" will probably occur a number of times in RAM, so you will need to examine the Toolbox display to see which corresponds to your program. When you have found it, you need to find the address of the program start. The address will have the same last three hex characters as Basic's program start address (PAGE) - F00 or whatever, so it should be easy to locate. The byte at this address will be &0D, and the next byte will be &00 (providing that the first line number of your program was less than 99).

Once you have the address of the start of your program in RAM, all you need to do is exit Toolbox, or whatever, and type something like:

```
PAGE=&A0F00
OLD
```

where &A0F00 is the address of the program start, and you should have your program back. You should then save it in the normal way. In the unlikely event that "OLD" gives you a "Bad program" message, this means that your program has been corrupted, and the teqnique for recovery is beyond the scope of this article.



```
000139C0:  0D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000139D0:  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000139E0:  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000139F0:  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00013A00:  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00013A10:  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00013A20:  00 00 00 00 52 65 63 6F 76 65 72 69 6E 67 20 4C  ....Recovering L
00013A30:  6F 73 74 20 44 61 74 61 0A 0A 4C 65 65 20 43 61  ost Data..Lee Ca
00013A40:  6C 63 72 61 66 74 20 6C 6F 6F 6B 73 20 61 74 20  lcraft looks at 
00013A50:  77 61 79 73 20 6F 66 20 72 65 63 6F 76 65 72 69  ways of recoveri
00013A60:  6E 67 20 70 72 6F 67 72 61 6D 73 20 61 6E 64 20  ng programs and 
00013A70:  64 61 74 61 20 6C 6F 73 74 20 69 6E 20 74 68 65  data lost in the
00013A80:  20 64 65 73 6B 74 6F 70 20 65 6E 76 69 72 6F 6E   desktop environ
00013A90:  6D 65 6E 74 0A 0A 0A 49 6E 20 73 70 69 74 65 20  ment...In spite 
00013AA0:  6F 66 20 74 68 65 20 65 78 63 65 6C 6C 65 6E 74  of the excellent
00013AB0:  20 72 75 67 67 65 64 6E 65 73 73 20 6F 66 20 74   ruggedness of t
00013AC0:  68 65 20 41 72 63 27 73 20 44 65 73 6B 74 6F 70  he Arc's Desktop
00013AD0:  2C 20 69 74 20 69 73 20 73 74 69 6C 6C 20 70 6F  , it is still po
00013AE0:  73 73 69 62 6C 65 20 74 6F 20 6C 6F 73 65 20 70  ssible to lose p
00013AF0:  72 6F 67 72 61 6D 73 2C 20 64 61 74 61 20 6F 72  rograms, data or
00013B00:  20 74 65 78 74 20 77 68 65 6E 20 77 6F 72 6B 69   text when worki
00013B10:  6E 67 20 77 69 74 68 69 6E 20 74 68 65 20 44 65  ng within the De
00013B20:  73 6B 74 6F 70 20 65 6E 76 69 72 6F 6E 6D 65 6E  sktop environmen
00013B30:  74 2E 20 54 68 69 73 20 63 61 6E 20 68 61 70 70  t. This can happ
00013B40:  65 6E 20 69 66 20 79 6F 75 20 73 69 6D 70 6C 79  en if you simply
00013B50:  20 71 75 69 74 20 61 6E 20 61 70 70 6C 69 63 61   quit an applica
00013B60:  74 69 6F 6E 20 77 69 74 68 6F 75 74 20 73 61 76  tion without sav
00013B70:  69 6E 67 20 79 6F 75 72 20 77 6F 72 6B 2C 20 6F  ing your work, o
00013B80:  72 20 6D 6F 72 65 20 69 6E 73 69 64 69 6F 75 73  r more insidious
00013B90:  6C 79 20 69 66 20 79 6F 75 72 20 61 70 70 6C 69  ly if your appli
00013BA0:  63 61 74 69 6F 6E 20 73 75 66 66 65 72 73 20 61  cation suffers a
Search mode       COPY for next match. ESCAPE to exit            ASCII
```

Using Toolbox to find the start of a text file

RESTORING TEXT FILES

If your lost data is a text file, you should be able to locate it using the same technique as described above. Use PAGE to find the start address for the string search, and enter a word which you know to be present in the file - again the search is case sensitive, so you must get the case exactly right, or the search will fail.

Next scroll up and down the file in memory using Toolbox or its equivalent, and find the approximate address of the start and the end of the file. Note these down (erring on the generous side if in doubt), then exit your memory search utility.

You should then save your data to disc, as follows. Suppose that the addresses of the start and end of the file were &B10A0 and &B1F80. From the Basic prompt, type:

```
*SAVE MyFile B10A0 B1F80
```

Now get back into the Desktop, and use DeskEdit (or Edit) to correct any errors in your file - for example, deleting any rubbish at either end. Now set the filetype of the file to that required by the application that you were originally using, and save the file to disc ready for use.

If your lost file was of some other type than Basic or Text, then you can still adopt a broadly similar approach to that suggested here for text, except that locating the file will be much more difficult, and once located, it may also be more difficult to find its start and end points. If you get stuck on the latter question, be generous in guessing at the file's start and end points, and then take a look at a datafile of a similar type, and see if you can find clues as to what the start and end might look like. Then load your generously saved chunk of RAM into DeskEdit (or Edit), and whittle away at the two ends until it takes on the look of a file of the type that you are trying to retrieve, and save it back to disc.

WORKING WITHOUT A RAM SEARCH MODULE

If you have no RAM searching software available at a time of need, you can always copy the whole of RAM to disc, and search the disc file for the lost file when you have obtained some suitable software. The following line should do the trick:

```
*Save MyFile 8F00 380000
```

The final hex value in this line is obtained by typing:

```
PRINT ~HIMEM
```

Unless you have very little RAM in your machine, you will not be able to use the above technique without a hard disc. If you were really desperate, you could save the whole of RAM as a number of files, each small enough to fit on a single floppy - but of course Murphy's law says that the file you wanted to find would be split over two discs!

Finally, I leave you with a short program. If you are trying to retrieve a lost Basic program, and have no RAM search module to hand, this will probably do the trick. It will locate possible starts to Basic programs whose first line number is 10. Alter the 0A in the penultimate line of the program to the value (in hex) of the first line number of your program if it differs from this. If the first line number is above 99 you will also need to alter the 00 which follows the 0A (to be precise, the two bytes are: *line no MOD 100* and *line no DIV 100*).

Grab as much RAM as you can for Basic, as described for the other recovery methods, type "OLD" and check that your program has not been reinstated, then run the program below (either type it in directly, or load it from disc by giving a full pathname). Then note down the addresses which it prints out. It will take a few seconds to scour the whole of RAM. When it has finished, start with the last address printed out, and type:

```
PAGE=&nnnnnn
```

where nnnnnn is the address as displayed. Then type:

```
OLD
```

and use LIST to check the program.

If you get a Bad program message, or this is the wrong program, try the next one up the list, and so on. The very last will be the finder program itself.

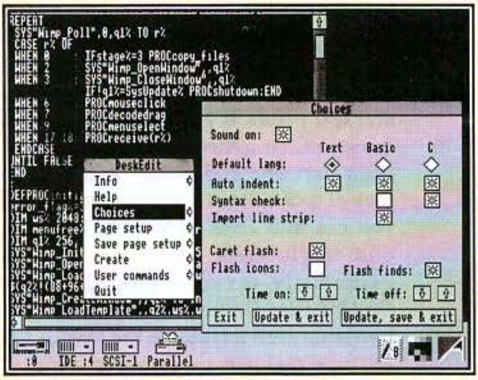
```
   10 REM Basic Program Finder
   20 REM by Lee Calcraft
   30 FOR A%=PAGE TO HIMEM-4 STEP 4
   40   IF (!A% AND &FFFFFF)=&0A000D
THEN PRINT ~A%
   50 NEXT
```

DeskEdit

DeskEdit is the ultimate all-purpose editor for the Archimedes, with special features tailored for use with plain text, Basic and C source.

General editing features

- Three special Find and Replace modes - from Simple to Power Search - the latter uses Twin-like specifiers
- Additional Quick-Search mode for rapid retrieval
- Text macros to insert user strings in both text and source code
- Special Undelete buffer for moving text around, in addition to Edit-style Undo/Redo
- Dedicated markers and position finders for finding your way around large files - create your own automatic indexer at the top of any file, and use it to move at a single keypress to any point referred to in your index. Ideal for both text use, and Basic and C source code.
- Clipboard, providing an alternative way to move text around



```
REPEAT
 SYS"Wimp_Poll",0,q1% TO r%
 CASE r% OF
 WHEN 0      : IFstage%=3 PROCcopy_files
 WHEN 2      : SYS"Wimp_OpenWindow",,q1%
 WHEN 3      : SYS"Wimp_CloseWindow",,q1%
               IF!q1%=SysUpdate% PROCshutdown:END
 WHEN 6      : PROCmouseclick
 WHEN 7      : PROCdecodedrag
 WHEN 9      : PROCmenuselect
 WHEN 17,18  : PROCreceive(r%)
 ENDCASE
UNTIL FALSE
END
```

Sound on: ☒

	Text	Basic	C
Default lang:	◈	◇	◇
Auto indent:	☒	☒	☒
Syntax check:		☐	☒
Import line strip:		☒	

Caret flash: ☒

Flash icons: ☐ Flash finds: ☒

Editing Basic

Plus

- On screen Help - full documentation in a scrollable window
- Instant file info feature, and current directory setter
- Caret flash controller for DeskEdit and other applications
- Customised user commands to open directories, run other applications and launch Obey files - all from DeskEdit's menu
- Numerous keyboard shortcuts including date and filename insertion, changing case, moving windows to the front or back of the stack, parking the mouse pointer, inserting printer codes etc. etc.

RISC developments

The former Publications, software and hardware activities of BEEBUG have been incorporated as a new company called RISC Developments Ltd. in order to develop and expand a range of products for the Acorn market.

RISC Developments Ltd, 117 Hatfield Road, St. Albans, Herts AL1 4J

dvanced multi-tasking Text Editor for the Archimedes

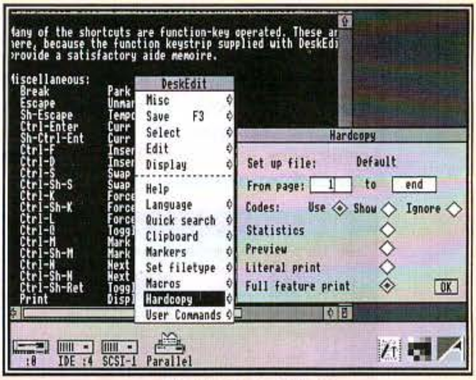
Printout

Printout makes full use of Acorn's version 2 drivers to provide fast text printout including style codes for bold, underline, italics, page breaks etc - all entered at the keyboard using simple keypresses.

Special text printing options with headers, footers, page numbering and style codes. Headers and footers can contain filename, date, time, page numbers (optionally offset) etc, and may contain their own style codes, and be left right or centre justified.

Print options include a useful Preview mode allowing you to see exactly what would be printed, before using any paper. This is useful for checking headers, footers page breaks etc.

Additionally a Statistics option gives a brief summary of aspects of the text to be printed, including character, word, line and page count.



```
1any of the shortcuts are function-key operated. These ar
1ere, because the function keystrip supplied with DeskEdi
>rovide a satisfactory aide memoire.

1iscellaneous:
  Break          Park
  Escape         Unmar
  Sh-Escape      Tempc
  Ctrl-Enter     Curr
  Sh-Ctrl-Ent    Curr
  Ctrl-F         Inser
  Ctrl-D         Inser
  Ctrl-S         Swap
  Ctrl-Sh-S      Swap
  Ctrl-K         Force
  Ctrl-Sh-K      Force
  Ctrl-L         Force
  Ctrl-Q         Toggl
  Ctrl-M         Mark
  Ctrl-Sh-M      Mark
  Ctrl-N         Next
  Ctrl-Sh-N      Next
  Ctrl-Sh-Ret    Toggl
  Print          Displ
```

Hardcopy

Set up file: Default

From page: 1 to end

Codes: Use ◈ Show ◇ Ignore ◇

Statistics ◇

Preview ◇

Literal print ◇

Full feature print ◈

Hardcopy options

Language specific features:

Plain text

DeskEdit will format word-wrapped text as you type (and to prove it, DeskEdit's 40 page manual was created and edited using DeskEdit itself).

Basic

Drag a Basic file to the icon, and it will automatically be detokenised and loaded into DeskEdit ready for editing. Press F3 to retokenise and save it after editing. Optional line number stripping.

Auto indent, automatic line number insertion, and checking for matched brackets and quotes - as you type.

Special Basic browser:

Ctrl R steps through all REM lines
Ctrl D steps through all procedure and function definitions
Ctrl P steps through all procedure references
Ctrl F steps through all function references

C language

Special C language features include a simple syntax checker which operates as you type.

Auto indent facility combined with automatic generation of opening braces streamlines source code entry.

C Function browser: Ctrl-F steps through function definitions.

This feature-packed editor is ideal for editing Basic, text files, Obey files, C source code etc.

Everything that you have ever wanted to be able to do in Edit, but couldn't.

DeskEdit, which is supplied with a 48 page manual and a function keystrip, costs

£19.95 inc VAT.

(Non-members' price is £24.95)

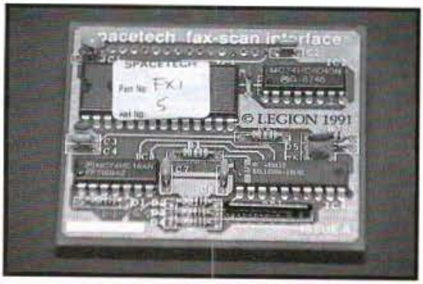
Stock Code **PEDT**
(For p&p see back cover)

Telephone (0727) 40303 Fax. (0727) 860263

Spacetech's FaxScan

Alan Wrigley looks at an inexpensive way of turning a fax machine into a scanner for your Archimedes.

The Amstrad FX9600 is a popular and versatile fax machine, with a number of features which make it particularly suitable for interfacing with a computer. Spacetech has now released a product for the Archimedes which enables you to tap into some of this potential.



The FaxScan interface

Called *FaxScan*, the package consists of a small circuit board which fits into an Arc or A3000 in the space normally allocated for an Econet board, and it allows you to use the scanning head of the fax machine as a 200 dpi monochrome scanner. Also included with the package is a single disc which provides the software to operate the scanner, and also an application which helps you to download a telephone directory to the FX9600 - another of its useful features.

THE FAXSCAN BOARD

The board is well-made and looks very professional. Fitting is quite straightforward, involving nothing more than removing the cover of the Arc and pressing the two rows of pins down into the connectors provided on the main circuit board. The instructions supplied with FaxScan are quite clear. A lead is supplied which connects the Econet socket on the rear of the Arc to the scanner output port on the FX9600.

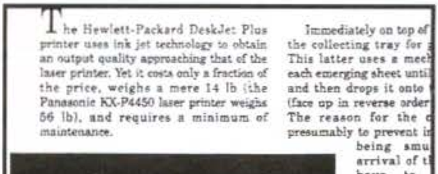
Using the Econet space in this way does mean, of course, that you cannot use FaxScan on a machine connected to a network. In practice, this is unlikely to be a problem for most users, and it does have advantages. For example, the card is suitable for all Archimedes and A3000 machines without any modification, and it does not take up a valuable podule slot.

USING THE FX9600 AS A SCANNER

The FaxScan application is installed on the icon bar in the usual way, and is very simple to use. An option on the icon bar menu allows you to choose between three resolutions for the scanned image: 50, 100 and 200 dpi. These resolutions provide 16, 4 and 2 grey levels, and require 120K, 240K and 480K of memory in the computer respectively. It should be pointed out that the actual scanner head in the fax machine is only capable of producing black and white images, and copes with greys by dithering. However, FaxScan restores the grey levels by integration. which it appears to do quite well.

The image is built up in a window on screen as the scan takes place, and is quite fast (under 25 seconds). The magnification of the screen display can be altered (though this does not affect the resolution or the actual size of the image itself), and the image can also be saved as a sprite. A neat touch is the ability to drag a box around any part of the image with the mouse, and save just the marked area.

After experimenting with the *Halftone* setting on the FX9600 to get the best results, I was quite impressed. Clearly there is a trade-off between resolution and greyscale representation, but even at the highest resolution, the dithering effect produced a very passable result in many of my tests. Nevertheless, you should bear in mind that a scanner such as Beebug's Scavenger can produce 16 grey levels at 200 dpi, and these grey levels are generated by the scanner itself, not re-constituted by the software. I doubt if you would be satisfied with FaxScan if you wanted to scan fully toned photographs at high resolution, but for many other purposes it is an excellent budget-priced alternative to a conventional scanner. The illustration shows a scan at 200 dpi; readers with long memories may like to compare this with the results from our scanner survey in Volume 3 Issue 7.



The Hewlett-Packard DeskJet Plus printer uses ink jet technology to obtain an output quality approaching that of the laser printer. Yet it costs only a fraction of the price, weighs a mere 14 lb (the Panasonic KX-P4450 laser printer weighs 56 lb), and requires a minimum of maintenance.

Immediately on top of
the collecting tray for
This latter uses a mec
each emerging sheet unti
and then drops it onto
(face up in reverse order
The reason for the
presumably to prevent i
being smu
arrival of t
have to
experienced
during test
graphics
noticeably da
some signa
wrinkling of

The Desk
both serial
interfaces, a
Archimedes
though t
(Centronics
favourite, b

The design of the DeskJet Plus reflects

not require comms protoc

Part of a page scanned at 200dpi (reduced)

OTHER FEATURES OF THE FX9600

In addition to the scanner output port described above, the FX9600 has a standard Centronics port which enables documents to be faxed directly from the computer without any need for an intermediate printed copy. The fax machine appears to the Arc as if it were an Epson-compatible printer, so by using PrinterDM set to Epson FX emulation, it is possible to send Draw files, sprites, DTP documents etc. directly from your computer down the line to a remote fax machine. I must stress that this is a feature of the FX9600 itself and is quite independent of FaxScan; in other words, you don't need FaxScan to be able to do this.

My tests with a Draw file indicated that accuracy of the image is not guaranteed at the receiving end, and the transmission time is also quite long (around 6 minutes for a single page Draw file). However, newer versions of the FX9600 are apparently much faster (to tell which you have, look underneath - early models are marked FX-1, later models FX-2). Nevertheless, even with the slower model, the ability to send the file direct is useful, for example, if you want to do an automatic mailshot to a number of people. And if you are merely sending text output, from a word processor, say, or from DeskEdit, the transmission time will not be noticeably different from the conventional method.

TELEPHONE DIRECTORY

The FX9600 has comprehensive facilities for storing up to 50 commonly-used telephone numbers, either for one-touch or two-digit recall. Each entry can hold separate numbers for speech and fax. It is possible to download the complete telephone directory from a computer via the Centronics port by preparing a text file in the correct format. Spacetech has provided a utility called *Directory* which will do this for you. The application simply displays a window laid out to show the name, telephone number and fax number of each entry. Details can be entered and edited, and when you are satisfied, choosing the *Update* option will send the data to the FX9600 and store it as a file on the Arc in one go.

CONCLUSIONS

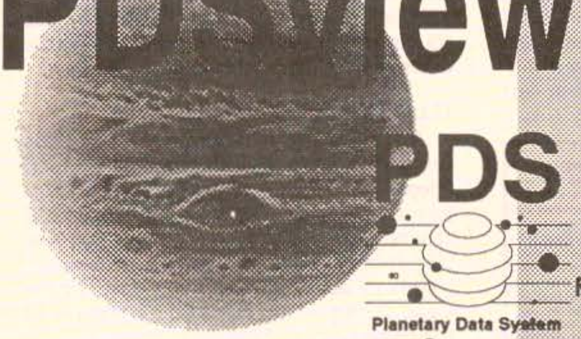
If you already have an Amstrad FX9600 fax machine, then for around £100 you can add a 200 dpi A4 scanner to your equipment. Provided that you are happy with the compromise between resolution and tonal range, this is a cheap route to take, and for many uses will certainly provide a worthwhile option.

If you don't already have a fax machine, then the FX9600 is well worth considering in any case, combining as it does a computer interface with a range of useful functions. In this case, Spacetech's offer of a half-price FaxScan package if you buy the machine from them looks very tempting, but it still might be worth looking around in case you can get the machine even cheaper elsewhere. Do make sure you get an FX-2 model, though.

Product	*FaxScan*
Supplier	*Spacetech* *21 West Wools, Portland,* *Dorset DT5 2EA* *Tel. (0305) 822753*
Price	*£116.91 inc. VAT - FaxScan only* *£576.63 inc. VAT, carriage & 1 year's maintenance - FaxScan plus FX9600 (FX-2 model)*

If ordering FaxScan only, you must state whether for FX-1 or FX-2. RU

PDSview



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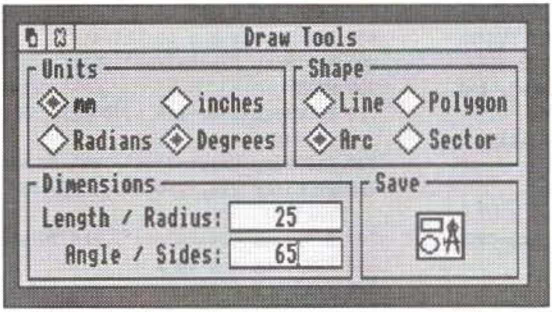
Draw Tools

by Andrew Hersee

Have you ever wanted to draw an arc, sector or polygon in Draw? If so, you will know how difficult it is, especially the former. This application will make creating such shapes easy.

DrawTools is an application which creates a separate tools window for use with Draw (or any other application which accepts Draw files). Any of the shapes provided within the DrawTools window can be selected and dimensioned as required before dragging and positioning in your main drawing. It is simple yet highly effective, and the idea could be extended if you have requirements for shapes other than those catered for here.



● mm ○ inches
○ Radians ● Degrees
○ Line ○ Polygon
● Arc ○ Sector
Length / Radius: 25
Angle / Sides: 65

The Draw Tools window

CREATING THE APPLICATION

First of all you will need to create an applications directory called !DrawTools. Within this directory you will need to save the files, !Run, !RunImage and !Sprites. The !Sprites file should contain a suitable mode 12 sprite, created with Paint, 34 pixels wide by 17 pixels high called !drawtools. It should also contain a copy of the sprite file_aff which you can find in the !Sprites file within Draw itself. To create the !Run file, load Edit (or DeskEdit) and click on the Create Obey option. Then type the following lines and save the resulting file as !Run.

```
IconSprites <Obey$Dir>.!Sprites
Wimpslot -min 32K -max 32K
Run <Obey$Dir>.!RunImage
```

To create !RunImage enter Basic and type in the program in listing 1. Once you have entered it, save it as !RunImage inside the !DrawTools directory.

USING DRAW TOOLS

Double-click on DrawTools to install it on the icon bar, as with any other application. Click on the DrawTools icon that appears, and a window will open. To draw a shape, click the corresponding radio icon (the available shapes are Line, Arc, Polygon and Sector). Now enter the relevant dimensions for the chosen shape. The Units section of the window offers a choice of inches or millimetres for the dimensions. Note that the size of a polygon is defined as the radius of a circle which passes through its vertices.

After entering the required information, simply drag the Draw file from the Save section of the window to the drawing you are creating. The shape will then appear in the drawing. The position of the pointer when you release the Select button will define where the object will appear. For all shapes except the line it will define the centre of the circle which defines the shape. With a line it defines the start point of the line. By switching grid lock on in Draw you can ensure that all the objects have the same centre. Note that if you drag the resulting Draw file directly to Draw's icon bar icon, the selected shape will be positioned in the bottom left-hand corner of the Draw window.

```
   10 REM             >!RunImage
   20 REM Program     Draw Tools
   30 REM Version     A1.00
   40 REM Author      Andrew Hersee
   50 REM RISC User   November 1991
   60 REM Program     Subject to Copyright
   70 REM             Not Public Domain
   80 :
   90 dsize=1024
  100 DIM bk% 512,tbk% 512,menu% 80
  110 DIM draw% dsize,mb% 1024
  120 ON ERROR PROCerror(REPORT$+" (internal error code "+STR$(ERL)+")"):SYS"Wimp_CloseDown":END
  130 PROCInitialise
  140 :
  150 REPEAT
  160  SYS "Wimp_Poll",6195,bk% TO flag
  170  CASE flag OF
  180   WHEN 2:SYS"Wimp_OpenWindow",0,bk%
  190   WHEN 3:SYS"Wimp_CloseWindow",0,bk%
  200   WHEN 6
  210    CASE bk%!12 OF
  220     WHEN -2:IF bk%!8=2 THEN SYS"Wimp_CreateMenu",,menu%,!bk%-100,132 ELSE !bk%=wmain:SYS"Wimp_GetWindowState",,bk%:SYS"Wimp_OpenWindow",,bk%
  230     WHEN wmain:PROCmouse_click
  240    ENDCASE
  250   WHEN 7:PROCinitinatesave
  260   WHEN 8:PROCkey_pressed
  270   WHEN 9:IF !bk%=0 THEN quit%=TRUE
  280   WHEN 17,18
  290    CASE bk%!16 OF
  300     WHEN 0:quit%=TRUE
  310     WHEN 2:PROCdatasaveack
  320     WHEN 6:PROCramfetch
  330    ENDCASE
  340   WHEN 19:IF bk%!12=myref THEN PROCerror("Can't transfer file")
  350  ENDCASE
  360 UNTILquit%
  370 SYS "Wimp_CloseDown"
  380 END
  390 :
  400 DEF PROCInitialise
  410 SYS "Wimp_Initialise",200,&4B534154,"Draw Tools" TO ,us%
  420 last%=1:quit%=FALSE:force%=FALSE
  430 !bk%=-1:bk%!4=0:bk%!8=0
  440 bk%!12=68:bk%!16=68:bk%!20=&301A
  450 $(bk%+24)="!DrawTools"+CHR$0+CHR$0
  460 SYS "Wimp_CreateIcon",,bk%
  470 $menu%="DrawTools"
  480 menu%!12=&00070207:menu%!16=16*10
  490 menu%!20=40:menu%!24=0
  500 menu%!28=2^7:menu%!32=-1
  510 menu%!36=&07000001
  520 $(menu%+40)="Quit"
  530 DIM w% 26,i% 1024
  540 $w%="sradiooff,radioon"
  550 $(w%+20)="A0-9."+CHR$0
  560 $bk%=STRING$(88,CHR$0)
  570 !bk%=200:bk%!4=272:bk%!8=916
  580 bk%!12=600:bk%!24=-1
  590 bk%!28=&87000052:bk%!32=&01070207
  600 bk%!36=&000C0103:bk%!44=-328
  610 bk%!48=716:bk%!56=&C700003D
  620 bk%!64=1:$(bk%+72)="Draw Tools"
  630 SYS "Wimp_CreateWindow",,bk% TO wmain
  640 !bk%=wmain
  650 DIM m(1):count=0
  660 FOR loop = 0 TO 15
  670 READ a,b,c,a$
  680 PROCicon(a,b,c,a$,bk%+4)
  690 SYS"Wimp_CreateIcon",,bk%
  700 NEXT
  710 PROCicon(296,-208,&0700F13D,"W",bk%+4)
  720 SYS"Wimp_CreateIcon",,bk% TO w1%
  730 PROCicon(296,-260,&0700F13D,"W",bk%+4)
  740 SYS"Wimp_CreateIcon",,bk% TO w2%
  750 FOR loop = 0 TO 2
  760 READ a,b,c,a$
  770 PROCicon(a,b,c,a$,bk%+4)
  780 SYS"Wimp_CreateIcon",,bk%
  790 NEXT
  800 ENDPROC
  810 :
  820 DEF PROCicon(a,b,c,a$,d)
  830 !d=a:d!4=b-44:d!8=a+LEN(a$)*16
  840 d!12=b:d!16=c
  850 CASE MID$(a$,1,1) OF
  860  WHEN "R" :d!24=w%:d!20=i%:d!28=LEN(a$)-4:$i%=MID$(a$,5)+CHR$0:i%+=LEN(a$)
  870  WHEN "W" :d!24=w%+20:d!20=i%:d!28=10:$i%=STRING$(10,CHR$0):m(count)=i%:count+=1:i%+=10
  880  WHEN "I" :d!24=0:d!20=i%:d!28=LEN(a$)-1:$i%=MID$(a$,2)+CHR$0:i%+=LEN(a$)
  890  WHEN "N" :$(d+20)=STRING$(12,CHR$
0):$(d+20)=MID$(a$,2)
  900  WHEN "S" :$(d+20)=STRING$(12,CHR$
0):$(d+20)=MID$(a$,2):d!8=a+68:d!4=b-68
  910  OTHERWISE:d!8=a+VAL(MID$(a$,1,3))
:d!4=b-VAL(MID$(a$,4,3))
  920 ENDCASE
  930 ENDPROC
  940 :
  950 DEF PROCerror(error$)
  960 SYS "Wimp_DragBox",,-1
  970 !bk%=ERR
  980 $(bk%+4)=error$+CHR$0
  990 SYS"Wimp_ReportError",bk%,1,"Draw
Tools"
 1000 ENDPROC
 1010 :
 1020 DEF FNgs(i%)
 1030 string$=""
 1040 WHILE ?i%>31
 1050  string$+=CHR$(?i%):i%+=1
 1060 ENDWHILE
 1070 =string$
 1080 :
 1090 DEF PROCmouse_click
 1100 IF bk%!16=20 AND bk%!8=16*4 THEN
 1110  PROCdragbox
 1120 ELSE
 1130  IF bk%!8=1 AND bk%!16>=8 AND bk%!
16<=15 THEN !tbk%=wmain:tbk%!4=bk%!16:tb
k%!8=1<<21:tbk%!12=1<<21:SYS"Wimp_SetIco
nState",,tbk%
 1140 ENDIF
 1150 ENDPROC
 1160 :
 1170 DEF PROCdragbox
 1180 x=!bk%:y=bk%!4
 1190 bk%!4=5:bk%!8=x-34:bk%!12=y-34
 1200 bk%!16=x+34:bk%!20=y+34:bk%!24=0
 1210 bk%!28=0:bk%!32=&7FFFFFFF
 1220 bk%!36=bk%!32
 1230 SYS"Wimp_DragBox",,bk%
 1240 ENDPROC
 1250 :
 1260 DEF FNradio(a)
 1270 bk%!0=wmain:bk%!4=a
 1280 SYS"Wimp_GetIconState",,bk%
 1290 =(bk%!24 AND 2^21)<>0
 1300 :
 1310 DEF PROCinitinatesave
 1320 d%=draw%
 1330 $d%="Draw"+STRING$(88,CHR$0)
```

```
 1340 d%!4=201:$(d%+12)="Draw Tools"
 1350 d%+=40
 1360 !d%=2:lenptr%=d%+4:d%!24=-1
 1370 d%+=40:path%=d%:!d%=2
 1380 r=VAL(FNgs(m(0)))*46080
 1390 a=VAL(FNgs(m(1)))
 1400 IF r<=0 THEN PROCerror("The Length
/ Radius must be more than 0"):ENDPROC
 1410 IF FNradio(8) THEN r=r/25.4
 1420 abort=FALSE
 1430 IF FNradio(13) THEN
 1440  IF a>50 OR a<3 THEN
 1450   PROCerror("Must have between 3 a
nd 50 sides."):abort=TRUE
 1460  ELSE
 1470   d%!4=0:d%!8=r:d%+=12
 1480   FOR loop=1 TO a
 1490    !d%=8:d%!4=r*SIN(RAD(360*loop/a
)):d%!8=r*COS(RAD(360*loop/a)):d%+=12
 1500   NEXT
 1510    !d%=0:d%+=4
 1520  ENDIF
 1530 ELSE
 1540  IF FNradio(11) THEN a=RAD(a)
 1550  IF a>2*PI OR a<0 THEN
 1560   PROCerror("The angle must be bet
ween 0 and 360 degrees"):abort=TRUE
 1570  ELSE
 1580   IF FNradio(12) THEN
 1590    d%!4=0:d%!8=0:d%!12=8
 1600    d%!16=r*SIN(a):d%!20=r*COS(a)
 1610    d%!24=0:d%+=28
 1620   ELSE
 1630    IF FNradio(15) THEN
 1640     d%!4=r*SIN(a):d%!8=r*COS(a):d%
!12=8:d%!16=0:d%!20=0
 1650     d%!24=8:d%!28=0:d%!32=r:d%+=36
 1660    ELSE
 1670     d%!4=0:d%!8=r:d%+=12
 1680    ENDIF
 1690     sangle=0
 1700    REPEAT
 1710     a-=PI/2:IF a>0 THEN angle=sang
le+PI/2 ELSE angle=sangle+a+PI/2
 1720     d=4*r*SIN((angle-sangle)/2)/(3
*COS((angle-sangle)/2)+3)
 1730     d%!0=6:d%!4=r*SIN(sangle)+d*CO
S(sangle)
 1740     d%!8=r*COS(sangle)-d*SIN(sangl
e)
 1750     d%!12=r*SIN(angle)-d*COS(angle
)
```

```
1760     d%!16=r*COS(angle)+d*SIN(angle)
1770     d%!20=r*SIN(angle):d%!24=r*COS(angle):d%+=28
1780     sangle=angle
1790    UNTIL a<=0
1800     d%!0=0:d%+=4
1810   ENDIF
1820  ENDIF
1830 ENDIF
1840 IF abort THEN ENDPROC
1850 !lenptr%=d%-path%+40
1860 SYS"Draw_ProcessPath",path%,&7000003A,,,,,,&80000000+lenptr%+4
1870 FOR loop=0 TO 3
1880 !(draw%+loop*4+24)=!(lenptr%+4+loop*4)
1890 NEXT
1900 size%=d%-draw%
1910 SYS"Wimp_GetPointerInfo",,bk%
1920 mb%!0=56:mb%!12=0:mb%!16=1
1930 mb%!20=bk%!12:mb%!24=bk%!16:mb%!28=!bk%
1940 mb%!32=bk%!4:mb%!36=size%:mb%!40=&AFF
1950 $(mb%+44)="DrawTools"+CHR$0+CHR$0+CHR$0
1960 SYS"Wimp_SendMessage",17,mb%,bk%!12,bk%!16
1970 myref=mb%!8:d%=draw%:sent=0
1980 ENDPROC
1990 :
2000 DEF PROCkey_pressed
2010 LOCAL len%
2020 IF !bk%=wmain THEN
2030  CASE bk%!24 OF
2040   WHEN &18E,&18F
2050    IF bk%!4=w1% THEN PROCmove_to_icon(w2%,m(1))
2060    IF bk%!4=w2% THEN PROCmove_to_icon(w1%,m(0))
2070   WHEN 13
2080    IF bk%!4=w1% THEN PROCmove_to_icon(w2%,m(1))
2090   OTHERWISE
2100    SYS "Wimp_ProcessKey",bk%!24
2110  ENDCASE
2120 ELSE
2130  SYS "Wimp_ProcessKey",bk%!24
2140 ENDIF
2150 ENDPROC
2160 :
2170 DEF PROCmove_to_icon(w%,m%)
2180 LOCAL len%
2190 !tbk%=wmain:tbk%!4=w%:SYS "Wimp_GetIconState",,tbk%
2200 len%=LEN(FNgs(m%)):SYS "Wimp_SetCaretPosition",wmain,w%,,,-1,len%
2210 ENDPROC
2220 :
2230 DEF PROCramfetch
2240 IF bk%!24<size%+draw%-d% THEN send=bk%!24 ELSE send=size%+draw%-d%
2250 SYS"Wimp_TransferBlock",us%,d%,bk%!4,bk%!20,send
2260 bk%!12=bk%!8:bk%!16=7:bk%!24=send
2270 SYS"Wimp_SendMessage",18,bk%,bk%!4
2280 d%+=send
2290 ENDPROC
2300 :
2310 DEF PROCdatasaveack
2320 IF bk%!12<>myref THEN ENDPROC
2330 SYS"OS_File",10,bk%+44,&AFF,,d%,d%+size%
2340 bk%!12=bk%!8:bk%!16=3:bk%!36=size%
2350 SYS"Wimp_SendMessage",18,bk%,bk%!4
2360 ENDPROC
2370 :
2380 DATA 12 , -20,&17000004,"364140"
2390 DATA 388, -20,&17000004,"316140"
2400 DATA 12 ,-180,&17000004,"458140"
2410 DATA 482,-180,&17000004,"222140"
2420 DATA 24 ,   0,&17000039,"NUnits"
2430 DATA 400,   0,&17000039,"NShape"
2440 DATA 24 ,-160,&17000039,"NDimensions"
2450 DATA 494,-160,&17000039,"NSave"
2460 DATA 26 , -48,&1721B113,"R---mm"
2470 DATA 200, -48,&1701B113,"R---inches"
2480 DATA 26 ,-100,&1702B113,"R---Radians"
2490 DATA 200,-100,&1722B113,"R---Degrees"
2500 DATA 402, -48,&1723B113,"R---Line"
2510 DATA 528, -48,&1703B113,"R---Polygon"
2520 DATA 402,-100,&1703B113,"R---Arc"
2530 DATA 528,-100,&1703B113,"R---Sector"
2540 DATA 24 ,-208,&17000119,"ILength / Radius:"
2550 DATA 24 ,-260,&17000119,"I  Angle / Sides:"
2560 DATA 560,-224,&1700601A,"Sfile_aff"
```

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The Baildon Electronics Cross-32 Assembler

Reviewed by David Spencer

Anyone who has dabbled with assembly language programming will know that an assembler is a package that converts mnemonics representing the microprocessor's instructions into the actual binary instructions stored in memory. An assembler for the ARM processor used in the Archimedes is built into the BBC Basic interpreter as standard.

Each microprocessor has a unique set of machine code instructions and corresponding mnemonics, and most assemblers will only support the microprocessor used by the computer they are running on. For example, the Archimedes assembler, as already mentioned, will assemble ARM instructions, while the BBC micro had an assembler for its 6502 processor, and assemblers are available for the PC to handle 8086-type instructions. However, it is often useful to have an assembler running on a particular computer, but able to assemble the instruction sets of many different microprocessors. Such an assembler is called a Cross Assembler, and it is just such a product, Cross-32 that is reviewed here.

INTRODUCING CROSS-32

Cross-32 as supplied supports thirty-five different families of processors, including general purpose ones used in personal computers, for example, the ARM2/3, the 6502 and the 8086; micro-controllers, such as the PIC16C50 and Intel 8051, that find hidden applications in everything from talking teddy bears to washing machines; and specialist processors such as the Texas Instruments TMS32010 and TMS32020 digital signal processors (DSPs), and the TMS34010 graphics processor. It is with these latter two classes that cross assemblers come into their own, as it is seldom possible to run an assembler on the native processor itself.

Rather than being hardwired for each processor family, though, Cross-32 works by means of a data table for each type, which defines the architecture of the processor, and its instruction set. In theory, it should be possible to cater for any processor type simply by creating a new data table - a process that takes between three and thirty hours according to the advertising.

Before going on, it is worth pointing out that Cross-32 is not a new product and is not unique to Baildon Electronics. It originated as a PC package developed by a Canadian company - Universal Cross Assembler - and has evolved over a period of time. Baildon Electronics' input has been to recompile the C source to run on an Archimedes, modify the assembler to cope with features unique to the ARM, generate the necessary data table for the ARM, and add a primitive RISC OS frontend.

RUNNING CROSS-32

Cross-32 is supplied on a single floppy containing the assembler and data tables, an example source file for each processor type, a couple of "read me" files covering last minute changes, and a copy of !System.

When run, Cross-32 puts an icon consisting of a maple leaf on the icon bar. Clicking Select over this merely produces an error saying that a file must be dragged to the icon to be assembled. The icon bar menu, in addition to the usual Info and Quit options, allows the filenames for the assembled output and a listing to be specified, and the default settings to be saved. Upon dragging one of the example files to the icon, the screen switches to mode zero, the assembly is performed, and on pressing a key you are returned to the Desktop. The output file and, if selected, the listing file are saved in the current directory using the filenames specified from the menu. Yuk! Whatever happened to RISC OS compliance?

Cross-32 can also be run from the command line and this could, if desired, be used from within an Edit task window to allow multi-tasking. However, assembly is quick enough that this is probably not necessary. Progress is reported during assembly, and at the end the time taken is given along with a checksum for the output file.

ASSEMBLER FEATURES

Any assembler worth mentioning has many features in addition to the conversion of instruction mnemonics. For instance, there should be a set of directives to place constants into memory. It is also useful to allow conditional assembly of blocks of code depending on a flag setting, and to have a looping directive to build data tables. Another important feature of most assemblers is the ability to define macros of commonly used code blocks that can be inserted during assembly with a single pseudo-instruction.

Cross-32 includes all the above, with the exception of looping, although there are a few restrictions. For example, macros cannot make use of other macros, and labels cannot be made local to macros, allowing possible clashes with the main program. Cross-32 also supports the full set of C operators for use in expressions. Unfortunately, the non-Acorn background of the package means that features such as "&" to represent hexadecimal numbers are not supported.

As well as allowing for different processors, Cross-32 also caters for specialist output formats in addition to a plain binary file - a very common one being Intel Hex format. This feature is of particular use with micro-controllers, for which programmers often require a particular file format.

DOCUMENTATION

Cross-32 is supplied with a 68-page A5 manual, which is printed in very small type to cram as much information in as possible. The various chapters cover installation, source file format, assembler directives, output file formats, error messages, and most importantly, creation of your own data tables for other processors.

The manual is very comprehensive and includes examples wherever appropriate. Indeed, the chapter explaining how to implement a new processor type is based totally around a case study for one particular processor. To supplement the documentation, Baildon Electronics offer a telephone helpline to all registered users, saying that they will talk to you as long as is needed.

CONCLUSION

At £175 plus VAT Cross-32 is more expensive than Acorn's new Desktop Assembler (see RISC User Volume 4 Issue 9), and as an ARM assembler, it is nowhere near as advanced as Acorn's package. Some of the missing features, such as automatic base registers and producing AOF output, are quite understandable, as they are ARM specific and cannot easily be fitted into a universal assembler. However, other omissions such as looping constructs, cross-referencing, nested macros and local labels should be addressed. Similarly, the RISC OS front-end is very disappointing, especially as it could have been improved greatly with only a few hours work. It would be nice to integrate Cross-32 into the Desktop Development Environment (see the Desktop Assembler review referred to earlier), including the throwback of errors to an editor. However, if you need a cross assembler, Cross-32 performs as well as its PC rivals for comparable money, and will do most jobs asked of it.

Rumour has it that a version 2 of Cross-32 is on the way, and it is well worth checking Baildon's upgrade policy before committing any hard-earned cash. That said, this product has potential and I'm sure it will survive the test of time.

Cross-32 costs £205.63 (inc. VAT) and is available from a number of suppliers including:

Morley Electronics Ltd.,
Morley House,
West Chirton,
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Public Domain Software

Norwich Computer Services has a range of over 50 discs of Archimedes public domain software from various sources. Many of the discs contain several quite substantial applications for as little as £3.50 per disc. Some of the more popular applications are…

- **!PCDir** – A desktop utility that allows the transfer of files between MS-DOS discs and Archimedes discs. (One of many programs on Careware Nº7 – £7. The aim of Careware discs is to raise money for charity. For each disc, £6 is sent direct to charity.)
- **!Translator** – This application allows you to translate between various image file formats – sprite, GIF, TIFF. (Careware Nº13, £7.00, which also has other graphics applications.)
- **!Draw+** is an updated version of !Draw with many extra features including keyboard short-cuts. (Also on Careware Nº 13, £7.00.)
- **Keystrip printer** – Creates !Draw keystrip from an !Edit file of the text. (Shareware Nº32, £3.50 – also has a lot of other DTP stuff on it.)
- **Golf** – an excellent implementation with full sound & graphics. (Shareware Nº41, £3.50)
- **DOS filing system and DFS reader/writer** – These are available on Shareware Nº31, £3.50, which also has a 'C' editor and various other utilities.

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Fireworks

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```
   10 REM           >FWorks
   20 REM Program   Firework demo
   30 REM Version   A1.22
   40 REM Authors   C.Cassidy, G.Fawkes
   50 REM RISC User November 1991
   60 REM Program   subject to copyright
   70 REM           Not Public Domain
   80 :
   90 ON ERROR PROCerror:END
  100 DIM code 1000,exp 50000,pos 80
  110 DIM XPos(8),YPos(8),XD(8),YD(8),co
l(8,1),voice(8)
  120 MODE0:OFF
  130 VOICES 8
  140 FOR N=1 TO 8
  150 SYS "Sound_AttachVoice",N,8+(N MOD
2) TO ,voice(N)
  160 NEXT
  170 max=40:c=1
  180 PROCAssem:PROCInit
  190 MODE9:OFF
  200 Num=1:T=0:TT=TIME
  210 COLOUR 1,7:COLOUR 1
  220 :
  230 REPEAT
  240 WAIT:TT=TIME
  250 CALL code
  260 IF T<TIME-RND(80) AND pos!(Num*8+4
)=max THEN
  270 T=TIME
  280 XPos(Num)=200+RND(680)
  290 YPos(Num)=10
  300 XD(Num)=(RND(63)-32)/4
  310 YD(Num)=25+RND(20)
  320 col(Num,0)=RND(10):col(Num,1)=max
  330 Num+=1:IF Num=8 Num=1
  340 ENDIF
  350 FOR N=1 TO 7
  360 IF YPos(N)>0 THEN
  370 GCOL 0:LINE XPos(N)-XD(N),YPos(N)-
YD(N),XPos(N),YPos(N)
  380 YD(N)-=1
  390 GCOL N*2:i=255/((YPos(N)+500)/400)
:COLOUR N*2,i,i,i
  400 LINE XPos(N),YPos(N),XPos(N)+XD(N)
,YPos(N)+YD(N)
  410 XPos(N)+=XD(N):YPos(N)+=YD(N)
  420 IF YD(N)<0 THEN
  430 a=base+(XPos(N) DIV8)+(40960-INT(Y
Pos(N)/4)*160)
  440 pos!(N*8)=a:pos?(N*8+4)=0
  450 GCOL 0:LINE XPos(N)-XD(N),YPos(N)-
YD(N),XPos(N),YPos(N)
  460 YPos(N)=0
  470 SOUND c,-15,53,10+RND(20)
  480 c+=1:IF c=9 THEN c=1
  490 ENDIF
  500 ENDIF
  510 IF pos!(N*8+4)<max PROCcolour(N):c
ol(N,1)-=1
  520 NEXT
  530 UNTIL FALSE
  540 END
  550 :
  560 DEFPROCerror
  570 FOR N=1 TO 8
  580 SYS "Sound_AttachVoice",N,voice(N)
  590 NEXT
  600 IF ERR<>17 THEN REPORT:PRINT ;" at
 line ";STR$ERL
  610 ENDPROC
  620 :
  630 DEFPROCcolour(n)
  640 t=col(n,0):n1=n*2:n2=n1+1
  650 m=1/max*col(n,1)
  660 CASE t OF
  670 WHEN 1:COLOUR n1,255*m,255*m,255*m
:COLOUR n2,255*m,255*m,255*m
  680 WHEN 2:COLOUR n1,100*m,200*m,255*m
:COLOUR n2,100*m,200*m,255*m
  690 WHEN 3:COLOUR n1,100*m,255*m,180*m
:COLOUR n2,100*m,255*m,180*m
```

```
  700 WHEN 4:COLOUR n1,175*m+80,120*m,0:
COLOUR n2,255*m,255*m,180
  710 WHEN 5:COLOUR n1,120,255*m,120*m:C
OLOUR n2,120,255*m,120*m
  720 WHEN 6:COLOUR n1,255*m,255*m,150*m
:COLOUR n2,255*m,255*m,150*m
  730 WHEN 7:COLOUR n1,255*m,255*m,255*m
:COLOUR n2,255*m,255*m,150*m
  740 WHEN 8:COLOUR n1,0,255*m,150:COLOU
R n2,0,255*m,150
  750 WHEN 9:COLOUR n1,255*m,255*m,220*m
:COLOUR n2,100*m,220*m,255*m
  760 WHEN 10:COLOUR n1,255*m,255*m,150:
COLOUR n2,255*m,255*m,150
  770 ENDCASE
  780 ENDPROC
  790 :
  800 DEFPROCAssem
  810 PRINT”Fireworks”
  820 PRINT'”This demo looks considerabl
y better in the dark!”
  830 PRINT'”Initialising ... Please wai
t”
  840 bit29=2^29
  850 DIM block &30
  860 !block=148:block!4=7:block!8=150:b
lock!12=-1
  870 SYS “OS_ReadVduVariables” ,block,b
lock+&10
  880 base=block!&10:size=block!&14
  890 :
  900 FOR pass=0 TO 1
  910 P%=code
  920 [OPT pass*2
  930 LDR R0,ps:MOV R2,#8:LDR R6,ex
  940 .lp1
  950 LDR R5,[R0,R2]:ADD R2,R2,#4
  960 LDR R1,[R0,R2]:ADD R2,R2,#4
  970 CMP R1,#max:BEQ lp1
  980 CMP R2,#64:BHI end
  990 MOV R3,#800:MUL R8,R1,R3
 1000 ADD R8,R8,R6
 1010 MOV R4,#0:MOV R7,#100:.lp2
 1020 LDR R3,[R8],#4:LDR R9,[R8],#4
 1030 CMP R9,#0:MOVNE R4,R4,LSL #4
 1040 ADD R3,R3,R5:LDR R10,bs
 1050 CMP R3,R10:STRHSB R4,[R3]
 1060 MOVNE R4,R4,LSR #4
 1070 SUBS R7,R7,#1:BNE lp2
 1080 ADD R1,R1,#1:SUB R2,R2,#4
 1090 STR R1,[R0,R2]:ADD R2,R2,#4
 1100 MOV R7,#100:.lp3
 1110 LDR R3,[R8],#4:LDR R9,[R8],#4
 1120 CMP R1,#max:MOVHS R4,#0:BHS skip
 1130 SUB R4,R2,#8:MOV R4,R4,LSR #2
 1140 TST R9,#2:ADDEQ R4,R4,#1
 1150 .skip
 1160 TST R9,#1:MOVNE R4,R4,LSL #4
 1170 ADD R3,R3,R5
 1180 LDR R10,bs:CMP R3,R10
 1190 LDRHSB R11,[R3]:ORRHS R4,R4,R11
 1200 STRHSB R4,[R3]
 1210 SUBS R7,R7,#1:BNE lp3:B lp1
 1220 .end
 1230 MOV PC,R14
 1240 .ex:EQUD exp
 1250 .ps:EQUD pos
 1260 .bs:EQUD base
 1270 .en:EQUD base+size
 1280 ]
 1290 NEXT
 1300 ENDPROC
 1310 :
 1320 DEFPROCInit
 1330 DIM ExpX(99),ExpY(99),EXD(99),EYD(
99)
 1340 ExpX()=0:ExpY()=0:R=RND(-8)
 1350 FOR n=0 TO 99
 1360 EXD(n)=(RND(127)-64)/(32*(n MOD2+1
))
 1370 EYD(n)=(RND(127)-64)/(32*(n MOD2+1
))
 1380 NEXT
 1390 off=0
 1400 FOR g=0 TO max
 1410 FOR n=0 TO 99
 1420 ExpX(n)+=EXD(n)
 1430 ExpY(n)+=EYD(n)
 1440 EXD(n)=EXD(n)*.98
 1450 EYD(n)=EYD(n)*.98
 1460 x=ExpX(n) DIV2
 1470 IF x<0 x=(ExpX(n)-1) DIV2
 1480 a=x+INT(ExpY(n))*160
 1490 exp!(off+4)=ABS(ExpX(n) MOD2)
 1500 exp!(off+4)+=(n MOD2)*2 : REM Colo
ur flag
 1510 exp!off=a:off+=8
 1520 NEXT:NEXT
 1530 FOR n=1TO8:pos!(n*8+4)=max:NEXT
 1540 ENDPROC
```

Simple Virus Protection

Alan Wrigley describes another weapon for use in the war against viruses, based on an idea by Andrew Benson.

Many Archimedes viruses operate by seeking out files of a particular type and then modifying them in some way. For example, the Archie Virus looks for files of type "Absolute" (&FF8), and appends code to them so that the virus is activated each time the application is run. Many applications, particularly those written in C or assembler, will have a !RunImage program of this type, for example, Edit, Paint and Draw. Other viruses may look for Obey files, such as the familiar !Run and !Boot files that can be found in most applications.

Because many viruses operate in this way, it is possible to fool them by altering the filetypes of such files so that they no longer appear to be Absolute, Obey or whatever. This is possible because RISC OS allows the type of any file to be changed, and also allows the default run action of any filetype (i.e. what happens when the user double-clicks on it) to be specified. So by altering the filetype of a vulnerable file to one not normally used, and specifying its run action, you can protect your machine from many of the viruses which are currently active.

First of all you must choose a filetype to use. This should be one of the group which has been set aside by Acorn to be available for users (&000 - &7FF). Any of these could be used, but as an example we will choose &101. Assuming that you are protecting Absolute files for the moment, you must first identify these (look for icons with "APP" in the top left-hand corner), and then alter the filetype, either by using the following command:

```
SetType <filename> 101
```

or by using a filetype-setting application such as our own *SetType* (Volume 3 Issue 3) or *Filer+* (Volume 4 Issue 5).

The next thing you need to do is to set the run action, and also give the new filetype a name. This is done with the use of two system variables, and you can set these with the following commands:

```
Set Alias$@RunType_101 Run %0
Set File$Type_101 Absolute
```

If you have a !Boot file or application which runs when you switch on or reset your Arc, then these two lines could be included in the sequence of commands executed at that time. If not, you could simply create an Obey file (using Edit), called perhaps *TypeChange*, which contains these two lines, and double-click on this file to activate the commands.

Finally, for your own benefit (this will not affect the virus or the protection against it), you can define a sprite for the new filetype to match the type which it replaces. The sprites for many of the common filetypes are built into RISC OS, so you can simply copy the ones you require and rename them. To do this, first run the following Basic program:

```
10 SYS"Wimp_BaseOfSprites" TO rom%
20 SYS"OS_SpriteOp",268,rom%,"ROMSprites"
```

This will save a sprite file called *ROMSprites*. When this is loaded into Paint you will see two sprites in the file called *file_ff8* and *small_ff8*. These are the sprites which relate to filetype &FF8. Rename them as *file_101* and *small_101* respectively, and save them in the !Sprites file of your boot application, if you have one. If not, save them to a new sprite file which is placed somewhere convenient, then add the following line to the TypeChange file mentioned above:

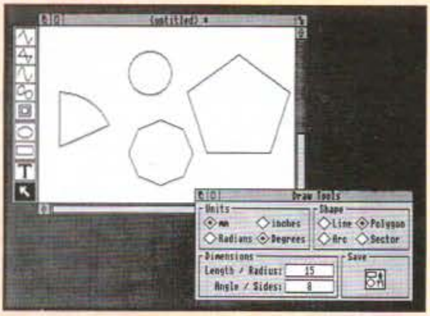
```
IconSprites <filename>
```

where *filename* is the name of the new sprite file, including its full pathname.

The technique described here could easily be adapted for Obey files (type &FEB) or indeed any filetypes which become endangered in the future. New viruses may of course outwit this method, but for the moment it will keep the user one step ahead of many of the viruses already in existence.

RISC User Disc Contents

DrawTools

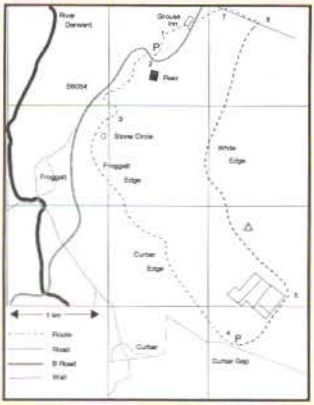


Units: ● mm ○ inches ○ Radians ● Degrees
Shape: ○ Line ● Polygon ○ Arc ○ Sector
Dimensions
Length / Radius: 15
Angle / Sides: 8

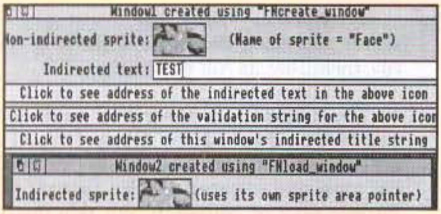
A toolbox for Draw allowing the precise creation of shapes such as circles, arcs, lines, sectors, at predetermined sizes and angles very simply.

WP/DTP: Cartography using Draw

A Draw file built up as described in this month's article showing how Draw can handle both text and graphics for detailed map work.



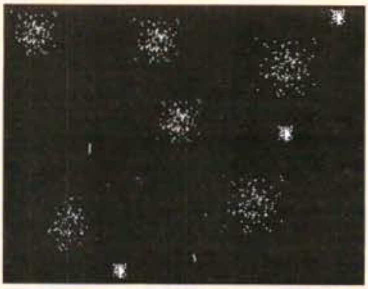
Exploiting The Wimp



Window1 created using "FNcreate_window"
Non-indirected sprite: (Name of sprite = "Face")
Indirected text: TEST
Click to see address of the indirected text in the above icon
Click to see address of the validation string for the above icon
Click to see address of this window's indirected title string
Window2 created using "FNload_window"
Indirected sprite: (uses its own sprite area pointer)

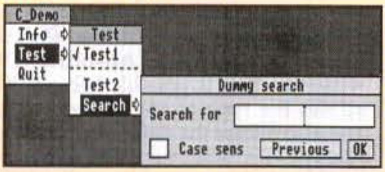
A demonstration of the procedures and functions described in this issue.

Fireworks Demonstration



A seasonal graphics demonstration which offers a display of exploding rockets complete with sound effects.

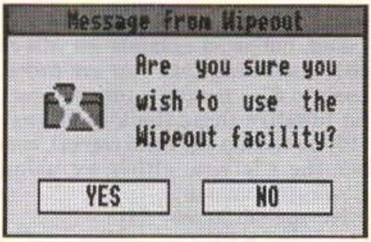
Using ANSI C (Part 5)



Example of a Wimp application written in C illustrating the use of *dbox*.

ADDITIONAL ITEMS REFERRED TO IN THE MAGAZINE

DeskStar



Message from Wipeout

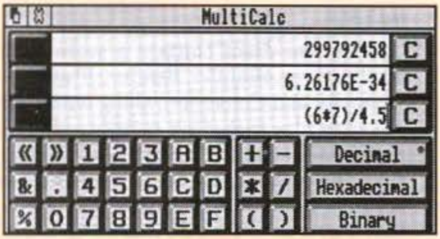
Are you sure you wish to use the Wipeout facility?

This application enables the user to set up a customised system of menus for accessing commonly used applications, directories, and star commands, plus a powerful Desktop file wipe facility.

All of these powerful applications and

vember 1991

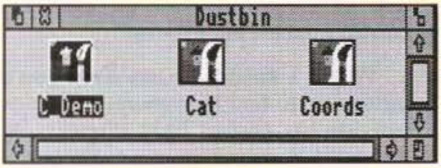
An Extended Multi-Function Desktop Calculator



This updated application provides a Desktop calculator with full decimal and hexadecimal keypad, calculations in binary, decimal, or hex, Undo and Redo options, and facilities to save and reload displays in addition to normal calculator functions.

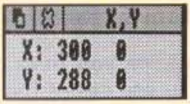
BONUS ITEMS

RISC User Dustbin



An updated version of the RISC User Dustbin with forced file delete in addition to normal Dustbin operation in this PD application.

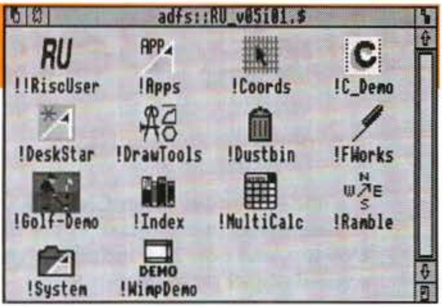
Mouse Co-ordinates Display



A very handy Wimp application which will display the co-ordinates of the mouse pointer as it is moved about the screen, showing both relative and absolute screen co-ordinates.

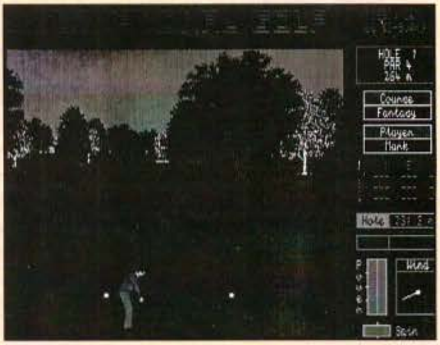
ArcScan Data

ArcScan indexes for this issue of RISC User and BEEBUG Vol.10 No.5.



This month's disc menu

International Golf



Play the demo version of this superb game complete with outstanding graphics and sound effects. Just listen to the birds singing as you play your first hole (needs minimum of 2Mbytes of memory).

See_Apps and Run_Apps

Updated versions of these applications from RISC User Volume 4 Issue 8 allowing applications to be automatically 'seen' or run when a system is first booted.

Volume 4 Special Disc containing the best of RISC User and lots more is out now! For details see p.4 of this issue.

lection of bonus items for only £4.75

Render Bender II

Reviewed by Richard Hallas

Render Bender from Clares has been improved to multi-task in the RISC OS Desktop, and now also includes a graphical scene-designer program.

THE PACKAGE

The Render Bender package consists of two discs and a wire-bound manual in the usual Clares style of cardboard box. I don't like this type of box at all: my review copy arrived squashed flat in the post, and I feel that a price tag of £135 really should justify a better quality package than a piece of thin folded cardboard. In fact, the box is the same as the one provided with the old version of the software, with a new version sticker on the front. Some of the features mentioned on the back of the box are therefore now out of date: for example, the box states mode 13 or 15; in fact, you can use any installed 256-colour RISC OS screen mode.

The manual is quite nicely presented, and is easy to follow. It directs new users to an appendix designed to guide the novice through the stages necessary to produce a simple animation quickly and easily. This is certainly a good idea, as you can see what the package can do without first having to wade through all 54 pages of the manual. The rest of the manual is easy to understand, but I found the style on the chatty side, and the grammar is quite poor in places. There are also a number of minor mistakes in the text, such as a reference to a menu instead of a window. On the whole, though, the manual is quite good, with a number of helpful exercises, but I thought that certain topics were given rather short treatment, and I found that it was somewhat difficult to distinguish between main sections and sub-sections. Furthermore, the technical section is supplied as a text file on disc. This really should be included in the manual.

IN USE

The two discs contain a suite of four applications (Render Bender, Illuminator, Animator and Converter), along with various resource files including sample animations and some scenes to trace. I was pleased to find the source file for the well-known soldiers animation, but was disappointed that the Newton's cradle (shown on the front of the package) was not included.

Render Bender, when loaded, will take a scene file produced by Illuminator and create the final picture(s) from it. The scene file may contain one or more frames: you can choose which ones to ray-trace. Most of the parameters associated with a scene are set in Illuminator, but certain ones must be set in Render Bender, for example sky colour and depth, floor-type, size and colour, and whether the ground is shiny or not. Thus quite different pictures can be created from the same source.

Within a Render Bender scene you can include up to four light sources. In order to provide the correct light intensity, it is necessary to enter into one of the writable icons a *Lamp Average* value which should make the formula 1/(No. of Lamps*Lamp Average) equal to 1. Ridiculous as it seems, Render Bender leaves you to calculate this value yourself. I cannot imagine why this isn't performed automatically, as it is only possible to have between 1 and 4 lamps. The icon could still be left alterable for special effects.

Render Bender allows you to select which floor pattern to use out of the 14 available, and the colours used in the patterns can all be altered. Alternatively you can use a sprite of your own design. When all the parameters have been selected, you can click on *Ray Trace Scene* and the processing begins. An option in the main menu allows you to select *Normal* or *Fast* mode: Normal mode means multi-tasking, whereas Fast takes over the whole machine. Fast mode is very much faster than Normal mode; even so, with my ARM3 machine, the accompanying illustration took over four hours to plot (as a mode 21 sprite, full size).

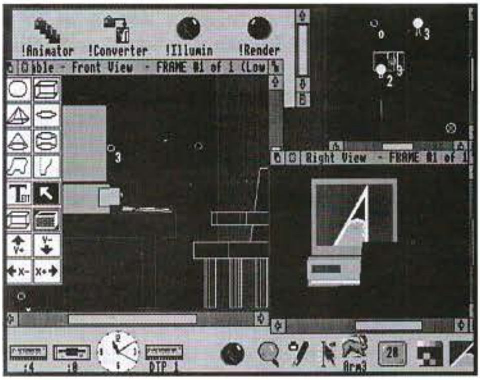

!Animator
!Converter
!Illumin
!Render
able - Front View - FRAME #1 of 1 (Low
Right View - FRAME #1 of 1
Y+
Y-
X-
X+
:4
:8
DTP 1
Arm3
28

Figure 1. Using Illuminator to create a scene

Once plotting has started, there is no easy way out: unlike the public-domain QRT, which can be paused, or Acorn's old Basic ray-tracer, which could stop part-way through a scene and resume at a later date, if you stop Render Bender plotting a scene it is lost, and you must start again. With very complex and time-consuming scenes, this is no joke: surely it wouldn't have been too difficult to allow a state-save procedure? The most you can do is decide how many frames of an animation sequence you wish to plot. I think it would also have been useful to allow the user to switch between Normal and Fast modes during a plot: once you have started the plot in either mode, you're stuck with it.

Curiously, this Render Bender front-end is, to my mind, the poorest part of the package, as it seems to contain at least a couple of bugs. During the course of normal operation, I was able to make it both crash totally and perform strangely without too much trouble, and some of these errors were not repeatable. I tried to plot an example file, Toys, as a mode 21 full screen picture, and was unable to do so. It came out fine in mode 13, and at other sizes (e.g. 1/64th size) in mode 21, but at full size I got an Address exception at about 80% through the plot. I tried it three times, once without any other software running, and the same thing happened every time, which is clearly not satisfactory. I must say, though, that I haven't experienced similar problems with any other files, so it may be because Toys is an old file not produced with Illuminator.

ILLUMINATOR

Illuminator is the most pleasing part of the suite to use, and behaves in a similar way to Draw (see figure 1). To use it to the full, however, a multisync monitor with a big screen mode is a great asset, because it is usually necessary to have at least two views of your scene open at once. A toolbox down the left hand side of the window, similar to the one in Draw, duplicates many of the main menu's more important functions, and shows the axes for the current view.

There are seven views available for use in Illuminator, perhaps the most interesting being the Render Bender view, which shows how the scene will come out when rendered. The six other views display the scene from the six sides of a cube. All but the Render Bender view allow editing, and as you edit in one window, the others are updated simultaneously. Each view can have its own zoom setting, and can display the objects as either solid or wire-frame.

The basic shapes available are sphere, box, pyramid, disc, cone and tube. In addition, you can create your own solids and surfaces by using the editor, which is quite easy to use once the principles behind it have been understood. One curious feature of this editor is that it encourages the creation of shapes with only one side! This can be a little off-putting at first. Text can be created in three fonts which combine spheres and tubes in different ways.

All of these items can be assigned a colour and property (shiny, metal, glass, mirror or normal). The colours provided are the same as those available outside the Desktop plus six others, 14 in all. I found this range rather limiting; QRT allows you to select the RGB colour components individually, so why not Render Bender? Individual objects can be animated by moving them along a path defined by a formula. This includes light sources and the viewpoint.

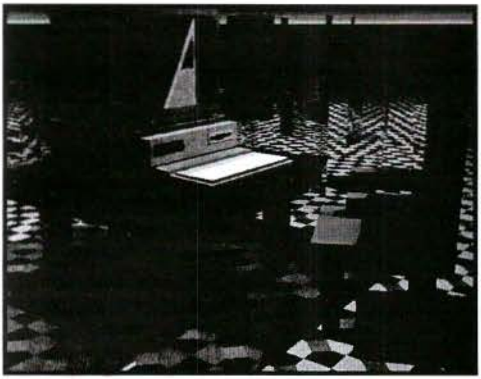


Figure 2. The completed, rendered screen

The whole program operates commendably smoothly, even in solid mode. This is not to say, however, that it is bug-free. I found that a window redraw in the Render Bender view could sometimes fail to update a rectangle, and for some reason, when dragging a view window around with Select (but not Adjust), if the toolbox lies over the window it flickers appallingly. A more important bug often prevents the loading of a Scene file (rather than a standard Illuminator file) and causes the program to quit with an error. I also found that some functions were difficult to perform. Rotation with the mouse is a very haphazard and jerky affair; a far better method is to use the Move window. However, this window is buried two levels into the menu structure, and cannot be kept open by clicking with Adjust. Therefore, if you want to perform multiple operations on an object, you must go through the menu structure for every one.

Aside from these points, Illuminator works very well. The other two applications, Animator and Converter, appear to perform faultlessly. Converter, the simplest program in the suite, allows you to convert Render Bender, Animator, ProArtisan and Illusionist files into sprites (there are also two small applications on the resource disc for converting these files to and from the new compressed format).

ANIMATOR

Animator takes a series of Render Bender, ProArtisan, Illusionist or Sprite files and turns them into an animation. You simply type the frame numbers, in the order you want them to appear, into a window and Animator compiles them into a Delta-compressed animation. The stand-alone animation produced can be either full-screen or in a multi-tasking window.

CONCLUSIONS

Reservations aside, Render Bender II operates very well. The greatest limitation in my view is with the range of colours available: with only 14 basic colours to use, true-to-life scenes simply cannot be created. Also, the range of colours in a rendered scene is limited to the 256. There will surely come a time when Archimedes computers have 24-bit colour capability available as standard, and even now, the PCATS graphics enhancer provides such facilities in a manner compatible with operating system standards. Render Bender provides no means of utilising these enhanced graphics, yet the public domain QRT does.

There are a number of other limitations: the refractive index and opaqueness settings for glass objects have to be set as a global value. It ought to be possible to assign these attributes to individual objects within the scene. There is no possibility for coloured light sources or texture and sprite mapping onto a surface. However, these features would presumably demand a more expensive package. What Render Bender does, it does well. If you feel the need for a ray-tracing package, then this is probably the easiest one to use.

Product	Render Bender II
Supplier	Clares Micro Supplies, 98 Middlewich Road, Northwich, Cheshire CW9 7DA. Tel. (0606) 48511
Price	£135.00 inc. VAT

RU

The 80 Column

The latest news and hints from the world of printers, compiled by Alan Wrigley

NEWS

Star has recently announced a new range of high-speed colour dot matrix printers called the ProtoCol series. Four models are available; the ZA-200 and ZA-250 are 9-pin models with 10″ and 15″ carriage respectively, while the XB24-200 and XB24-250 are the 24-pin versions. The ZA models operate at 420cps (draft) and 84cps (NLQ), have 8 resident fonts and a 32K buffer as standard (expandable to 160K). The XB24 models have 14 fonts plus Super Letter Quality (SLQ) and a buffer size of 29K expandable to 189K (XB24-200) and 76K expandable to 236K (XB24-250). They operate at 332cps (draft) and 100cps (NLQ), and feature an LCD panel set-up facility which does away with DIP switches. Other features of the printers are similar to those of their predecessors (see the review of the XB24 in Volume 3 Issue 9).

HINTS

The following hint from Peter Hopkins provides a short Basic program which allows you to set a small typeface on your Epson-compatible printer. It makes use of condensed and superscript, and also compresses the line spacing.

```
VDU 2
......
VDU 1,27,1,83,1,0:REM Superscript
VDU 1,15         :REM Condensed
VDU 1,27,1,49    :REM 7/72" line spacing
......
VDU 3
```

BUBBLEJET

We have received a number of requests for information on setting up *PrinterDM* for a Canon BubbleJet printer. It appears that some of the printer drivers that have been supplied for this printer have incorrectly claimed 360x360 dpi operation when in fact they could only produce 360x180 dpi.

To obtain true 360x360 dpi, add the following printer definition to the *PrDataSrc* file if you have a release 2 printer driver, or the *PrData* file if it is an earlier driver. The *pxres, pyres, pxres_halftone, pyres_halftone, dump_depth, line_prologue* and *interlace* settings are all exactly as the Epson LQ850 definition already in the file. The *line_epilogue* definition must be as follows:

```
"<27>[\<4><0><0><0><104><1><27>3<47><10>"
```

while the *line_interlace* should be:

```
"<27>[\<4><0><0><0><104><1><27>3<1><10>"
```

and finally the *job_epilogue* should be:

```
"<27>[K<1><0><1>"
```

If you want to do fancy text printing (release 2 drivers only) you will also need the following lines at the end of the definition:

```
draft_job_prologue: "<18><27>W<0><27>7"
draft_job_epilogue: "<12><27>[K"
draft_pica:         "<18><27>W<0>"
draft_elite:        "<27>W<0><27>:"
draft_condensed:    "<27>W<0><15>"
draft_expanded:     "<27>W<1>"
text_char163:       "<27>6<156><27>7"
```

The last of these lines allows a pound sign to be printed correctly.

POSTSCRIPT BUG

Finally this month, if you have purchased a Star LaserPrinter 8 with StarScript, you may find a problem when printing text in the system font. This is due to a bug in Acorn's *PrinterPS*, which can be cured by amending the *PSProlog2* file inside the driver's application directory. Load the file into Edit, then go to the end of the file. The fourth line from the bottom begins *astore 5 -1 roll*. This line should be amended to read:

```
astore { 32 sub 8 mul cdefs exch 8
getinterval } imagemask
```

Archimedes Software

RISC OS Terminals Plus

A new communications package for the Archie. Consisting of Viewdata and text terminals providing accurate ANSI, VT100 and VT220 emulations. Fully RISC OS compliant. File transfer protocols supported include, ASCII, Xmodem, Ymodem, Zmodem, Kermit and CET Telesoftware. Unlike most programs, these have been written from scratch in ARM code, making them compact, and fast. Easy exchange of data with other programs e.g. mark text for transfer to Edit. File transfers can take place whilst you work with other things. ACF scripts let logon and configuration be set up for easy reuse. Zmodem allows the resumption of interrupted downloads and achieves fast transfers.

Programs, manual, case £17.97 inclusive.
(upgrade from disc 24, £11.98 + old disc)

Disc 7 - Chess Program for The Archimedes.

A Chess program that takes full advantage of RISC OS, installing itself on the icon bar and running on the desktop in a window. You can work with other programs whilst you play Chess. Many features, computer play, hint, save games, edit etc. Risc User July 1991 said: *"Chess is an absolute bargain. .playing at a comparable level it always beat Micro Power's offering. ...this has to be the one to go for".*

Disc 8 - CrossStar 2.XX Crossword puzzle solver

Fully RISC OS compliant desktop Crossword puzzle solver. 200,000 word dictionary. Solves interlocking clues. Editable/user definable dictionaries. Saves grids as Draw files. Browse through dictionary. Check grid for new words.

Disc 16 - Spark RISC OS Archive program

Spark, allows you to store files and directories in archive files in a very compressed form. e.g. sprites often take up only 10% of normal space. Files in archives, can be accessed just like files on disc. Now new Spark series 2.XX, has lots more features. Reads all these formats, zoo, zip, lzh, UNIX and Archie Tar, Compress. Reads and writes PKarc, SEA/PC arc, uucode, atob/CET+, FCET.

Disc 32 - Charm. High level language and environment.

Charm, is a high level language similar to Pascal and C. This implementation, includes a compiler, linker and assembler, with an editor, and a desktop environment to use them. The Charm system is both fast and ideally suited to being used on 1Mbyte and floppy machines. Charm is not a toy language. Examples and two full scale demos with source code are included. Charm is a low cost way to produce fast ARM code programs from a high level language.

Disc 33 - Panorama. Draw the World.

180,000 coordinates outlining the lakes, rivers, continents, state boundaries etc. of the World and a program that can produce Draw files from them. You can make maps of any part of the world and then use them in DTP etc. programs. Includes the positions of nearly 1000 cities. Does simple, cylinder, Mercator and perspective projections. Can be used from a single floppy disc and requires no setting up.

Discs are £5.99 each all inclusive. Buy four claim one free!

David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR.

Free Air Mail delivery on overseas orders. Extensive range of other Archimedes software available (programmers tools, games, utilities, clip art), please send for free list.

WP/DTP:

Cartography with Draw and Edit

Richard Watkinson describes in detail the steps needed to combine text and graphics using Edit and Draw.

The map shown here was produced using the Draw application and is another example of just how much can be achieved with this piece of software and a bit of planning.

I regularly plan short rambles for our staff socials, and decided that I could do better than the usual hand drawn map "cut and stuck" onto the route description. The details below will show you how to set about this, and even if you are not interested in producing maps you could treat this as a Draw tutorial. Basic understanding of the Draw tools, and the dragging and resizing of Draw objects is assumed (see the User Guide for help if you need it).

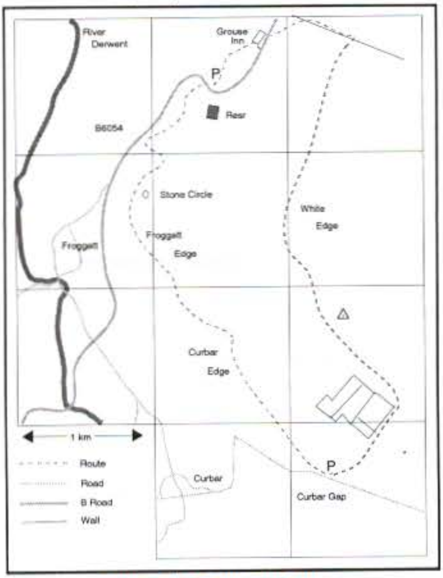


Figure 1 Completed map

The first stage is to plan exactly how much detail to show on your map - and this is up to you. I wanted a large scale and this example is based on an Ordnance Survey 1:25000 map. Some effort is needed initially, but once a basic template has been set up this can be used for any number of maps.

SETTING UP A TEMPLATE

After installing any fonts and loading Draw, open a Draw window and then go to the *Misc* menu and choose *Paper Limits*. Click on *A4* and *Portrait* with the Adjust button (to preserve the menu). It's also a good idea to click on *Show* if your printer driver is installed, as you then know exactly how much of the window is usable. Now go to the Draw *Zoom* submenu and choose a scale of 1:2. Finally click on the top right icon of the Draw window to bring it to (almost) full size.

Drawing the detail is much simpler if you have a framework, and on a 1:25000 map this consists of 4cm squares. From the *Grid* submenu choose (again use Adjust) *Show*, and *Lock*, and then from the *Cm* (Centimetre) submenu, choose a spacing of 4. You can now draw the grid squares using the rectangle tool. The example requires 11 squares as shown. Just point at a cross and click with the Select button then go to the opposite corner and click again. Repeat this for the remaining squares.

As you build up a picture in Draw it makes sense to group all of the parts together so that if you reposition it, bits don't get left behind! Go out to the *Select* submenu and choose *Select all* followed by *Group*. You can position the framework somewhere on the top left of the page (you may need to unlock the grid to obtain the best position).

The next stage is to produce the legend and any symbols you intend to use on the map. In the example the styles and sizes shown in figure 2 were used.

LABELS	Homerton Medium 8pt	
SYMBOLS	Homerton Medium 12pt	
ROUTE	A green dashed line	- width 0.5
ROADS	A solid yellow line	- width 1
B ROAD	A solid orange line	- width 2
WALLS	A solid black line	- width THIN
RIVER	A solid blue line	- width 4

Figure 2 Styles and sizes for map

Zoom up to 2:1 and locate the bottom left corner of the framework. Then using *Grid*, choose 6 subdivisions from the *Cm* submenu - this will help to align the legend. You will find that it is easier to put the lines in place with the grid locked and the text with the grid unlocked. Exact positions can be fine tuned later.

Note: you will find it very difficult to select individual items while the framework is grouped. Temporarily *Ungroup* it and *Clear* from the *Select* menu while you adjust the positions of individual items.

Select the line drawing tool and the corresponding *Styles* for the route from the table in figure 2 (make line colour your final choice as it removes the menu). Draw a line covering 3 divisions (click on Select to start and double-click to finish - Adjust cancels). Repeat this process for the roads and wall.

To complete the legends, select the text tool and use the *Style* menu to choose the *Font name* and *Size*. Position the text cursor by clicking Select, and type in the text, pressing Return after each entry (including the last). Once entered you will need to align the words correctly. Do this by selecting and dragging them into place (grid unlocked). When you are happy with the layout, drag a select box around all of the legend items (or select each one in turn using Adjust) and *Group* them from the *Select* menu.

To produce the scale at the top of the legend you need two equilateral triangles. These are produced using a locked *Isometric grid* with a spacing of 1 x 2 subdivisions. When you have set this, choose the closed line tool and, from the *Style* menu, a *Fill colour* of black. Click once on the first two corners of the triangle, and double click on the third to complete it.

You should find that the leftwards pointing triangle is correctly placed but the right one will need moving (grid unlocked). Before you do this, draw another unfilled triangle as this will be used later. Return to a locked rectangular grid with a spacing of 4, and 24 subdivisions. Draw the two thin lines leaving a gap of 5 subdivisions for the "1 km" scale - type it in. Group the items making up the scale, fine tune the positions of all the legend items and then group everything except the unfilled triangle.

Save all the work you have done so far as a basic map template for future use (you can also add other symbols).

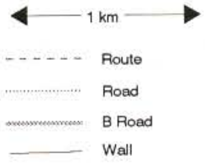


Figure 3 Legends

DRAWING THE MAP

You can now put the paths, roads, rivers etc. onto the framework. *Zoom* back to 1:1 or 2:1 if you prefer. Make sure the grid is unlocked, and set the number of *Cm* subdivisions to 8 (for a guide only). Select the curved line tool (3rd from the top) and choose the appropriate style (see figure 1) for the line you are going to draw.

Using the squares of the framework, choose a starting point and click Select. Now move the cursor to an obvious change of direction and click again. Don't worry if the line isn't quite right, it can be fine tuned in a moment, but if you do want to "rub out" a point press Delete. Repeat this process until you reach the last point, and this time click with Adjust. Now you will see all your points as blue squares with two orange squares known as control points. By using Adjust you can move the blue squares if necessary, and change the curve's shape using the control points. When you are happy with your work press Select.

Now for the remaining symbols. The unfilled triangle should be in the second square up on the right. Select it, drag it into place, then choose *Rotate* from the *Select* menu and enter either 30 or -30 depending on which way you drew it. To put the dot in the middle of it use text mode and type a full stop.

Rectangles and squares are best entered normally, put into position and then rotated to the required orientation. Place-names and labels can be typed straight in using the same font as for the legend.

ADDING TEXT

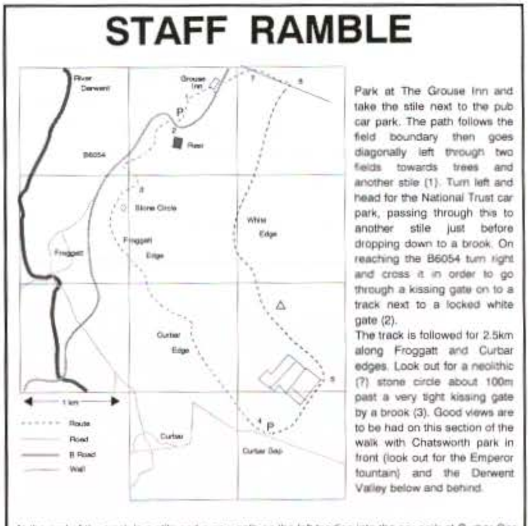
At this stage you can print your map and the final quality is very much dependent on the printer. I have had excellent results from a 24-pin printer, and then photocopying for issue to the ramblers. In fact the photocopies were better than the original! The map also looked good when printed on an Integrex Colour printer.

However you may wish to add some text, a route description for example, and unless you have access to DTP you must use Edit to create this first before loading into Draw.

Importing text into Draw from Edit is a little daunting for the first time, but there is an excellent article on the subject in RISC User Volume 3 Issue 3. I would also recommend *DTP for Free* published by Leeds Education Information Technology Centre (address at end of article).

Basically you need a header for your text to tell Draw what to do with it. This contains information about the fonts to use, line spacing, format and number of columns. This is the header used in the example:

```
\! 1
\F 0 Homerton.Medium 12
\0
\AD
\D2
\L16
```



STAFF RAMBLE

Park at The Grouse Inn and take the stile next to the pub car park. The path follows the field boundary then goes diagonally left through two fields towards trees and another stile (1). Turn left and head for the National Trust car park, passing through this to another stile just before dropping down to a brook. On reaching the B6054 turn right and cross it in order to go through a kissing gate on to a track next to a locked white gate (2).

The track is followed for 2.5km along Froggatt and Curbar edges. Look out for a neolithic (?) stone circle about 100m past a very tight kissing gate by a brook (3). Good views are to be had on this section of the walk with Chatsworth park in front (look out for the Emperor fountain) and the Derwent Valley below and behind.

At the end of the track is a stile and a new path on the left leading into the car park at Curbar Gap (4). Go through the car park to another stile leading to the new concession path which bears left along a farm track to begin with but when this swings left keep straight on down a dip to a stream and then uphill alongside a wall to reach White Edge at a Guidepost (5). Turn left in the direction of Longshaw.

Continue along White Edge past the Trig Point on your right until in 3km you reach a wall and another Guidepost (6). Turn left in the direction of the Grouse Inn, alongside the wall. When the path starts to descend, continue in more or less the same direction through some trees until a gate is reached (7) giving access to a path running diagonally left through fields straight to the pub.

Figure 4 Final result combining text and graphics

The first line is a compulsory version number. Lines 2 and 3 specify and select the only font I used. Line 4 *Double Aligns* the text to the column edges while line 5 specifies 2 columns. Line 6 is the line spacing (or leading), set to 16pts.

Open an Edit window and type in the header. Type your text immediately below this. One point to remember is to press Return at the very end of your text otherwise Draw will not accept it. Save a copy of the text to disc for safety.

It is usually possible to have both Draw and Edit running together (unless you are very short of memory), and this avoids the need for saving the text separately. To import the text directly, make sure you can see your Draw page zoomed at 1:2. From Edit follow the procedure for saving the text, and drag the text file icon directly onto your Draw page (alternatively drag the file from disc).

A small area of text will appear which will now need sizing and positioning. Using the *Select* tool, you can move the text and split it into two independent columns which can be put anywhere and at any size.

The first click on your text area will select both columns, and all you can do at this stage is move it about. A second click will select just one column. This can be sized and moved independently of the other column. The example has the first column to the right of the map and the second underneath it. Use the bottom right ear to drag the columns out to the required size.

To finish off, use the text tool and a suitably large font to create a title. The example was in Homerton Bold at 40pts.

There you have it, and though quite a lot of careful work is needed to get started, it becomes increasingly effective if you need to perform the same task regularly. It is also yet another example of the capability of Draw to address so many user requirements.

Contact Address:
Education Information Technology Centre, West Park Curriculum Development Centre, Spen Lane, Leeds LS16 5BE.

Break the A310 RAM barrier. (And the price barrier too)

2Mb - £99

Educational and quantity discounts are available.

There is also a 4Mb version. The 2Mb card may be upgraded later to the full 4Mb. Compatible with ARM3s, backplanes, hard discs etc. Low power consumption. High quality four-layer circuitry. No quibble money-back guarantee.

Prices exclude VAT. Further information and free price list from:

A3000 memory corner

Upgrade to 2Mb	£55
Upgrade to 4Mb	£148.95
Bare board	£25.50

These upgrades are very easy to fit, and use just 8 chips to minimise power consumption. The bare board has high quality turned pin sockets for the RAM chips.

Hard disc upgrades

We can supply a range of fast hard disc upgrades for the Archimedes and A3000. Example SCSI drives;

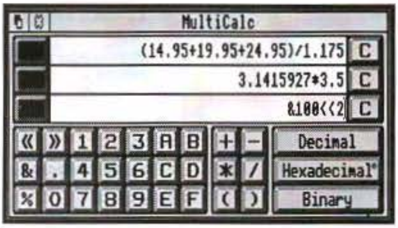
50Mb - £310 100Mb - £420 200Mb - £620

IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286

An Extended Multi-Function Calculator

by Mike Ironmonger

This is a much extended version of an application first published in RISC User Volume 3 Issue 2. This latest version has an extended keyboard allowing binary, decimal and hexadecimal input; the use of brackets allows more complex mathematical expressions to be built up; and there are now Undo/Redo functions on the keypad (indicated on the by << and >> symbols) allowing previous actions to be undone, or repeated.



```
(14.95+19.95+24.95)/1.175
3.1415927*3.5
&100<<2
```

The MultiCalc display

Any of the three register displays can be dragged (as a text file) to any other suitable application for copying results and other information. Displays can also be saved and reloaded as required.

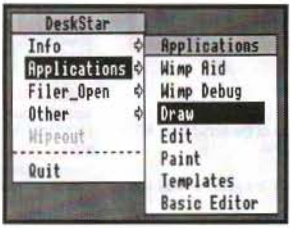
All calculations, as before, can show the result in binary, decimal or hexadecimal, regardless of input format, and nine commonly used scientific constants can be entered with a single key. Other options allow the number of digits and format of a numerical display to be determined by the user. Full instructions for using the application are included on the disc. RU

For reasons of space, both the applications on this page are supplied only on this month's magazine disc.

DeskStar

by Mik Towse

DeskStar allows the user to set up a customised system, such that all commonly needed applications, directories and star commands can be accessed from within the Desktop environment using standard RISC OS menus.



Sample Applications menu from DeskStar

DeskStar uses three text files, saved within its application directory, called *Apps*, *Dirs* and *Other*. These should be created by the user (using DeskEdit or Edit) to contain application, directory and command information as required by the user. The application is supplied with examples of these three files, showing the format needed, which users can edit to suit their own needs.

From the DeskStar icon bar menu, a further facility can be set up to the left-hand side of the icon bar called *WipeOut*. The purpose of this is to allow one or more disc files to be deleted from within the Desktop (effectively using the ADFS *Wipe command). A menu allows you to determine what *Wipe options should take effect (forced deletion, verbose etc.), and you can save your current choices in this respect for automatic loading next time around.

Any file or directory to be deleted is simply dragged to the the WipeOut icon bar icon.

WipeOut is a powerful tool which can easily erase whole directories without further ado. As a precaution, whenever any file or directory is dragged to the WipeOut icon, you will be asked whether or not you wish to proceed. Do check the current settings of the *Wipe options if you are not sure. RU

RISC User

New Releases

November

1991

DEMOS

PD42 Disc

4 demos, AceDemo4, Cubitus, Scorpius and 3D_RayPic.

GRAPHICS

PD44 Disc

A selection of fractal generation programs and utilities.

PD45 Disc

Two applications, Creator and Translator, which allow the exchange and display of graphics picture files between the Archimedes and other computers. Along with these are some high quality demo pictures. Also included are a mode converter and a mode utility allowing multisync modes to be displayed on a non-multisync monitor.

MUSIC

PD43 Disc

An application called Coconiser, very similar to Tracker, that allows the creation of tunes by sequencing digitally sampled sounds. Demo tunes are included on the disc.

PD46 Disc

The Jukebox playroutine plus the following Tracker tunes: Beginning, Blue Peter, Frog Song, IceIceBaby, Monty Mix, Over The Bow, Rawhide, SkyXmasMix, Thunderbird

PD47 Disc

A selection of SoundTracker and Tracker playback routines and utilities including a keyboard and spectrum analyser.

DEMOS

PD12 Disc

Five sound and graphics demos from Hugo Fiennes of the Serial Port. All five are stunning examples of what the Arc is capable.

PD21 Disc

Three demos, Balls, Balls2 and BIA-Tetris. The latter is a game as well as a demo.

PD22 Disc

Three demos, Noah, Chips and Demo01.

PD23 Disc

Four demos, Bounce, Crimbo, ColDemo and Rotate.

PD24 Disc

Three demos, Demo, Gopher and Overscan.

PD25 Disc

Four demos, Deskballs, DudsDemo, EgIntro, and Z-Brother.

PD26 Disc

Four demos, Sister, SkullDemo and Wibble.

PD27 Disc

Two demos, GrannyChow and Windows

PD36 Disc

Three demos, Leapin' Fish, SinDemo and Swallow.

PD37 Disc

A massive four-part demo called 'No RISC No Fun'. This has to be the best demo yet for the Arc. Amazing!

GRAPHICS

PD13 Disc

The !Projector application - displays films created with the Ace Computing Mogul package. Six example films are included.

PD18 Disc

A program which displays several still and animated ray traced pictures.

PD33

Disc Contains a program that displays several still and animated ray traced pictures.

EDUCATION

PD14 Disc

!REG, a student register system which replaces classroom registers. A system for managing the recording and reporting required by the National Curriculum and data files for Pipedream for NC statements of attainment in science.

DRAWING AND ART

PD15 Disc

Arctist+ and BigM, both 256 colour art packages, along with Design, a symmetrical pattern designer.

PD41 Disc

Four applications: 'Display' allows the display of Draw files by dragging them into a window. 'Drawplus' is an object oriented drawing package that may be used as an alternative to Acorn's Draw supplied with your Archimedes or A3000. Drawplus has many enhancements over Draw. 'Drawstrip' is a program to enable the easy creation of function keystrips using Draw. 'Drop' enables Draw files to be rotated in 3D and then saved again in their new perspective.

MUSIC

PD01 Disc

Soundtracker playroutine plus the following tunes: Aces-Hi, Acidbat2, Afl, Alf, ArtNoise, AxelF, Backpopped, Big, Blitzwing, Blizzard02.

PD02 Disc

Soundtracker playroutine plus the following tunes: BatMix, Bobby, Brill, Burning, Chartmix, Chipgene, Demo2.

PD03 Disc

Soundtracker playroutine plus the following tunes: Confusion, Crack, Criminal, Dear, Demons, Dns, Elephant.

PD04 Disc

Soundtracker playroutine plus the following tunes: Doc1, Funky, Ducksong, Electric_2, EndTheme, Enutomed, Equinoxe5, FinalTFDMI, FinalVis.

PD05 Disc

Soundtracker playroutine plus the following tunes: Fyc, GoodTune, Hello, HowDeepIs, Huba, Humanoid, Hunters, Hymn, Idea, Igarun, IntoB.

PD06 Disc

Soundtracker play-routine plus the following tunes: Jazzid, Jmj_China, LastNinja2, Like, Magnetic4, MegaForce0, Minimize, Mod, New_Biz.

PD07 Disc

Soundtracker playroutine plus the following tunes: MyWay, Nothing-2, Oooerr, Outrun, Pacman, Pat, PetShop, Pretend, SaySaySay2, Steeve

PD16 Disc

230 tunes for loading into the music package Maestro, with enough variety to suit most tastes.

PD08 Disc

Soundtracker playroutine plus the following tunes: Setrox, Tarzan, TGM, TheModel2, TjatMikes, Toccata, Unit, Vprtex, We're, Yezz.

PD09 Disc

Soundtracker playroutine plus the following tunes: Acid_House, Bananas, Cambod, Crok, Cute, Dallas, Deadlock, Dragnet, Yazoo.

PD 10 Disc

Soundtracker playroutine plus the following tunes: DemoSmash, FFSound, Five, GSCTheme, HiEnergy, Oxygene2, Piano, PopCorn, PumpUp.

Public Domain Discs

This month we are offering six new discs from our Public Domain Library. Further titles will be added in the future. We also offer a **Sampler** disc with a selection of public domain programs from all areas of interest.

Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and there are some instructions with the programs.

It is our policy with our Public Domain Library that the Public Domain discs are available only to RISC User members for **£3** (postage is £1 for the first disc and 50p for each additional disc). The discs are offered as seen, and we cannot enter into any discussion regarding their contents.

To order phone **(0727) 40303**, Fax (0727) 860263, or write to (quoting your membership number):

RISC Developments Ltd,
117 Hatfield Rd, St. Albans, Herts AL1 4JS

PD 11 Disc

Soundtracker playroutine plus the following tunes: Rescue, Rockit, Round,Scratch, Scratch2, Show, SmokeOn.

PD 40 Disc

The Jukebox playroutine plus the following Tracker tunes: Acid House, TeddyBears, Canon, Breathe, Six2, Rag It.

TRICKS AND NOVELTIES

PD 17 Disc

A collection of 27 amusing trick and novelty programs. Some of them produce the weirdest effects!

PD 32 Disc

Contains an application called Cookie. When run, it puts up a window containing a 'fortune cookie' or a well-known saying or piece of philosophy. Be warned! This program is very addictive once seen, also rather zany not to mention, occasionally saucy! There are some 6000 sayings. Also on this disc is a scroll text demo with soundtrack music called Invade that also features a space invaders game within it.

UTILITIES AND APPLICATIONS

PD 28 Disc

20 utilities of various types. There is something here no doubt to please everyone. Space does not permit full descriptions but the file list is, 1stFile, ASm2, CloseUp, Crypt, Dir, Display, Drawlink, Dustbin, Filetypes, FileUtils, Find, Keys, Loadprogs, MultiPrint, NewBar, NewCodes, PD _Impress, PrinterTx, ProgCalc, and Set_Type.

PD 31 Disc

17 utilities and applications. There is plenty on this disc to choose from and should find favour with most people. Brief description of the list is as follows: Address Book, Address Labeller, DiscSpace Display. Desktop Calendar, Cassette Inlay Printer (Two of these!), DFS Disc Reader, Automatic Application Creator, Arc to Psion Transfer, ROM Speed-Up, STD Codefinder, System Utilities, Trash Can, Front end for Twin, Front end for View, Volume Controller, Control of Pointer by keys.

PD 38 Disc

15 utilities and applications. These are a 1st Word Plus file converter, a 1st Word Plus printer driver for Star LC200, a text outliner application, a hypertext program (like Genesis), a CD database, a video tape database, CMOS RAM saver and loader, disc sector editor, fast formatter, font printer, file save reminder, a COPY options setter, and TEXT to DTPfile converters, plus a print spooler.

CLIPART AND PICTURES

PD 29 Disc

Over 4 megabytes of Sprite pictures which can be used as clip art to load into DTP or use in your programs. The files are naturally in a compressed form and the disc contains the file to uncompress them together with instructions.

PD 30 Disc

Over 2 megabytes of Sprite clip art and Draw files to load into DTP or use in your programs. The files are naturally in a compressed form and the disc contains the file to uncompress them together with instructions.

FONTS

PD 35 Disc

Eleven PD outline fonts for use in RISC OS applications such as WP and DTP. These are, Stencil, American Typewriter, Bodoni, Brushscript, Cooper Black, Fritz Quad, Garamond, Hull, London, Optima and Revue.

COMMS

PD 34 Disc

Arcterm3, a full comms software package. Arc100, a scrolling text terminal. Grapevine, another scrolling text terminal but multi-tasking. TaskData, a multi-tasking viewdata comms package. Download, an application for transferring files between machines via serial port.Timer, a utility for recording on-line time and call cost. The latest version of Sparkplug, the file decompression program. Along with these is a complete set of programs for running a bulletin board system on your Archimedes.

GAMES

PD 19 Disc

10 games: Adevnture, Battle, Battleships, Connect4, Darts, Fish (Pelmanism), Fruit Machine, Golf, Hangman and Impact.

PD 20 Disc

12 games: Invaders, Line Of Five, Othello, Pelmanism, Rocks, Rubik Cube, Simon, Solitaire, Star Trek, Tetris, Tile Trial and Yahtzee.

PD 39 Disc

6 games: Pac Man (in a window!), Arc Patience, Breakout (inside an icon!!!), Creepie (Centipede), Pelmanism and International Golf (Brilliant!)

Public Domain Sampler Disc (PDS1)

Ccontains sample programs from the Beebug Public Domain Software Library.

SOUNDTRACKER

The Soundtracker application is used to play back a music file ***Toccata*** made of real sampled sounds which are sequenced to form a complete tune lasting several minutes. The quality of this is quite stunning, particularly if played through the computer's monitor speaker, or a hi-fi system.

ACCOUNTS

This is a home accounts program. There are no instructions included with the program but all functions are selected from the main menu which is self explanatory. An example file is included.

SC LABEL

A versatile disc labelling program producing professional looking labels for 3.5" discs. A Help file is included with the program.

FOLLOW

A novelty program that when run puts a pair of beady eyes on the Desktop which follow the mouse pointer wherever it goes. Eerie!

HANGMAN

A well presented and implemented version of the old word game of Hangman with an animated finale.

MULTIPRINT

A utility to allow the printing of files by creating a task list of the files to print before sending them to the printer. A Help file is included within the program.

ROTATE

A fascinating animated demo in which you can alter the effects by pressing a few keys on the keyboard.

STD

A useful utility to search for telephone STD codes or find a town from its STD code. A ReadMe file is included in the program.

WANDA

A novelty demo program that infests your Desktop screen with a shoal of bubble-blowing goldfish!

PC Compatibility

Andrew Benham introduces a two-part article which aims to help you assess whether a PC application will work under the PC Emulator. Part 2 follows next month.

From discussions with users, it seems that one of the main uses of the PC Emulator is to enable software brought from work to be used at home (you are reminded to check that the terms and conditions of the software agreement allow this). There are also PC programs which perform tasks that are not available yet on the Archimedes. These uses can therefore be divided into two categories: "convenience" and "essential".

The most common problem that arises from use of the PC Emulator is that of software compatibility. The "convenience" users are usually not too badly affected - often the program has been bought for use on a PC anyway, and so if it works under the Emulator then it's a bonus, and if it doesn't then it isn't a disaster. However, if you buy a piece of software with the specific intention of using it under the PC Emulator, it can be a severe embarrassment if it doesn't work. Asking the average PC software dealer whether a particular package will work under the Archimedes PC Emulator is unlikely to be a very rewarding experience! You might be lucky and get a dealer who will allow you to return software that doesn't work, but then again you might not.

This article seeks to explain some of the reasons why problems may occur, so that hopefully users can predict whether software is likely to work under the Emulator, and thus not waste time trying packages that will certainly not work. The article may, by virtue of the fact that it addresses compatibility issues, seem rather negative. You should remember however that the PC Emulator does an amazing job. Not only does it have to take machine code written for a totally different microprocessor and emulate execution of it, but it also has to model other hardware devices which are not present or whose functions are achieved in "non-PC" hardware devices. The fact that the Emulator can achieve all this at a speed comparable to that of a real PC is truly impressive.

HARDWARE ACCESS

One of the causes of compatibility problems is the way in which programs are written. It is akin to the problems BBC users often experienced in running some programs written for the BBC Model B on a BBC Master, or running programs "over the tube". Whilst computer designers provide documented system calls to access the machine's resources (e.g. OSBYTE and OSWORD calls in the BBC world), some software authors insist on bypassing these calls and poking the hardware directly. The same problem applies to the PC. There are system calls provided to access the hardware, but many pieces of software ignore the supported calls and access the hardware directly. To be fair though, the performance of some programs would suffer considerably if they only used supported calls.

The PC Emulator tries to handle both types of access. It has far better success with the supported system calls than it does with direct hardware access (although it manages some direct hardware access quite well). This is not too surprising as the supported system calls are documented and understood, whereas with direct hardware access you can never predict exactly what software authors are going to do.

DOS was originally intended to run on any machine that had certain hardware elements. The hardware devices would be accessed via a different BIOS (Basic Input Output System) for each different hardware configuration, but the operating system would be the same. The PC hardware configuration has become a standard, and so the "generic DOS machine" concept has rather died out, but it does mean that any program which is capable of working on a "generic DOS machine" (rather than just on a "PC") is a very good candidate for working under the PC Emulator.

As a practical example of a hardware problem, consider the RS232 interface (the "serial port"), which in PC parlance is called a "COM" port. BBC users may be surprised to learn that the serial port on a PC is not provided with operating system buffers. The PC system calls that control the port involve more instructions than direct hardware access would, and this reduces the top speed at which the RS232 interface can operate. Therefore many software authors will insist on accessing the hardware of the RS232 port directly. The PC Emulator, however, supports the system calls by passing them via the RS232 buffers in the Archimedes, which means that the serial port works very well if the software uses the supported calls (the "BIOS" method). The Emulator attempts to model the PC hardware to cope with programs which use direct hardware access, but problems can be experienced with such packages (the dreaded "FATAL: Internal Stack Failure, System Halted" message).

DISCS

The first step in trying any new software package is physically introducing it to the computer. In almost every case this will be done by floppy disc. All Archimedes machines are fitted with a 3.5" drive as standard, and many users will have fitted a disc buffer to enable external 5.25" drives to be used as well. There are 4 standard PC disc formats which are commonplace (several others may be regarded as obsolete), namely:

Size	Double Density	High Density
5.25"	360K	1.2M
3.5"	720K	1.44M

The compatibility issue is straightforward. The Archimedes floppy disc controller (Western Digital 1770 family) is physically incapable of handling High Density disc formats, so the 1.2M and 1.44M formats can be neither read nor written. The 360K and 720K disc formats are both Double Density, as used by the Acorn ADFS. In Acorn terms, the 360K format is 40 track double sided, and the 720K format is 80 track double sided. So you should ensure that the software to be tried is available on 360K 5.25" or 720K 3.5" floppy discs.

A word of warning is necessary here - discs which are protected against unauthorised copying may not work under the PC Emulator. In order to achieve the copy protection they may employ some direct hardware access calls to the floppy disc controller which are not supported by the Emulator. Even version 1.6 of the Emulator does not emulate the disc system beyond the BIOS level. Incidentally, do not be tempted to reformat pre-formatted 1.2M High Density floppies with "standard" (i.e. not PC High Density) drives. The magnetic properties of the discs are different and the chances are the disc will not be usable.

MICE

Every Archimedes is supplied with a mouse, and if you have the latest Emulator (version 1.6), mouse driver software is supplied with it, and you may therefore ignore the rest of this section. But if you have an earlier version of the Emulator, you will find that it knows nothing about the existence of the mouse. The reason for this is that when you buy a PC, a number of things that Arc owners take for granted are regarded as "extras". The "PC" tends to comprise a motherboard, a case, a keyboard, a power supply and a floppy disc drive. You then buy additional hardware to make up the working system to your own specification and budget. So you might buy a hard disc, a monitor, a display card (to give the PC the capability to display text and graphics on the monitor!), serial port(s), a parallel printer port, and probably a mouse. These extras are made by various manufacturers, and often come with software drivers in the shape of "bolt-on additions" to the operating system to tell it how to access the new hardware. Versions of the Emulator before 1.6 quite simply have no mouse driver software provided with it. The solution sounds simple - install some!

Well, it isn't quite *that* simple. Firstly, the mouse hardware for PCs can be split into two sorts: "serial" mice and "bus" mice. A serial mouse plugs into one of the PC's serial ports, and a bus mouse plugs into a special connector (often on a separate plug-in card in the PC). The Acorn mouse appears to the PC to be a bus mouse, so you need a bus mouse driver. Dealers normally only sell the software with the mouse itself, so any attempt to buy mouse driver software on its own will probably be met with blank stares. That leaves 2 obvious choices: write a mouse driver from scratch, or find one. If you know how to write a mouse driver then almost certainly you don't need to read this article, which leaves the option of finding a driver.

Assuming you have managed to find one (perhaps from a PD source or a friendly dealer who is willing to sell it separately), you can now try installing it on the Archimedes. Programs with names ending in ".COM" can be installed by running as normal programs. Those ending in ".SYS" will need to be installed in the "CONFIG.SYS" file, by adding the following line to the file:

```
DEVICE = [path]name.SYS
```

and the system re-booted (which can be achieved by pressing the Ctrl, Alt and Delete keys simultaneously). Even after this, the mouse may only work with certain packages. The problem is that, as usual, some software bypasses the supported system calls and accesses the hardware directly. If the software package includes configuration options for various types of mice, then this may well mean that the program accesses the hardware directly: in these cases remember to try a bus mouse option.

In Part 2 next month, Andrew Benham looks at compatibility problems which may arise with keyboards, memory limits, processors, display options and serial ports. RU

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C Notebook

Compiled and linked by Lee Calcraft

PRODUCT NEWS

CLib 3.75

CLib 3.75 has been released for general use, and since it contains a number of bug fixes, it should be used wherever possible.

DeskEdit

Although I admit to bias, DeskEdit is a very useful editor for use with C. It can check syntax as you type, and contains a variety of powerful features for finding your way around source code. There is even a function browser - Ctrl-F takes you to the start of the next function definition, while Ctrl-Shift-F takes you to the start of the previous function - for more info, see the ad. in this issue.

NON-ICON TASKS AND win_activeinc()

by Ian McDougall

If you are writing a Desktop application which does not install an icon on the icon bar, you must make a call to *win_activeinc()* to increment the number of windows assigned to your task. If you do not, the number of windows known by your task will be zero, and *event_process()* will exit, killing your task at the same time. The reason that this does not occur when an icon is installed on the icon bar is because *baricon()* makes a call to *win_activeinc()* automatically for you.

CLAIMING NULL EVENTS

by Ian McDougall

If you want null events to be delivered to your task, you must not only claim idle events using *win_claim_idle_events()*, but you must also set the event mask to allow null events to be returned, as they are masked out by default.

COMPILING WITH MAKE

by Tony Shew

Tony Shew writes to tell us of a way to automate the process of compiling and linking under ANSI C Release 3 (the process is automated under Release 4).

He gives his MakeFile a special filetype (he uses 0x099), then sets an alias in his Boot file as follows:

```
Set Alias$@RunType_099 MakeIt %%0
```

When he double-clicks on any MakeFile, it runs a short piece of code named MakeIt which he has written in C, and which sets the directory containing the MakeFile (which it derives from argv[1]) to be the CSD, calls Amu, and then resets the CSD back to the URD.

The closest alternative to this is to use an Obey file to achieve the same effect, but this means that you need a dedicated Obey file in the directory of each application that you are developing.

Note that although Acorn have assigned a filetype of 0xfe1 to MakeFiles for use with their new DDE suite, it is not recommended that you use this filetype with the technique described above, since the native run action of type 0xfe1 is to run the new Make utility.

AUTOMATIC CALCULATION OF ARRAY SIZES

by Michael Lane

Functions which manipulate arrays frequently need to know the number of elements in an array which has been passed to them. The following macro solves the problem efficiently:

```
#define ARRAY_SIZE(name) \
      (sizeof (name)/sizeof (name)[0])
```

This calculates the number of elements by dividing the total size of the array by the size of the first element. For example, the following line would print the number of elements in the array *array[]*:

```
printf("The array has %d elements",\
  ARRAY_SIZE(array));
```

ASSEMBLER WITHOUT OBJASM

by Cristian Ghezzi

If you do not have Objasm, you can still incorporate assembler routines into your C programs. You can do this quite simply by creating a relocatable module, and calling it from your C program with a user SWI.

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Into the Arc

The Flexibility of the Archimedes (Part 1)

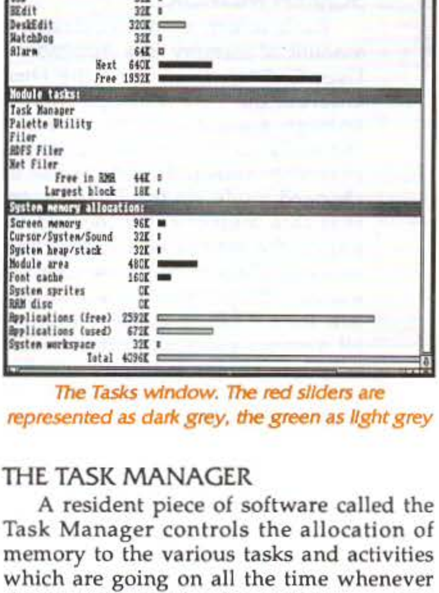
Alan Wrigley explains how to manage your computer's memory allocation to suit the task in hand

To the beginner, it can often seem as though the Archimedes is intended to be as unfriendly as possible. Incomprehensible error messages such as "System resources not found" or "No room in RMA" appear out of nowhere, reinforcing the view that this is a computer designed for the guru, not the average user.

In fact, many of the common problems arise precisely *because* the Arc is designed with the user in mind. Acorn's philosophy is that most of the machine's configuration settings should be decided by the user and not by the applications which run on the computer. This applies to screen mode and colours, memory usage and a whole host of other variable settings. The sense of this is obvious - the computer can be fine tuned for the task in hand, rather than being optimised for perhaps the most common tasks to the detriment of anyone who wants to use it for anything else. In a nutshell, the Archimedes is a complex and powerful machine that allows you to choose the most suitable environment for the job in hand.

Unfortunately, there is a price to pay for this flexibility. The whole idea of user configuration implies a steeper learning curve when you first try to get to grips with an Archimedes. This means that you cannot automatically expect the best performance if the configurations are not suitable for the task in hand. Moreover, when the configurations don't match the expectations of the software, you can end up with perplexing error messages, which often mean nothing to an experienced user, let alone a novice. This all means that learning to use an Arc is like learning to drive - daunting at first but second nature when you are used to it.

This article, and its sequel next month, will attempt to explain some of the areas in which you have control over the configuration of your computer. In this issue I will look at memory allocation, and next month at the range of default configuration settings which are stored in the non-volatile CMOS RAM in the Arc, and which therefore remain in force even if the computer is switched off.



```
Application tasks:
Sticky BackDrop       192K
CSD                    32K
BEdit                  32K
DeskEdit              320K
WatchDog               32K
Alarm                  64K
                Next  640K
                Free 1952K
Module tasks:
Task Manager
Palette Utility
Filer
ADFS Filer
Net Filer
         Free in RMA   44K
       Largest block   18K
System memory allocation:
Screen memory          96K
Cursor/System/Sound    32K
System heap/stack      32K
Module area           480K
Font cache            160K
System sprites          0K
RAM disc                0K
Applications (free)  2592K
Applications (used)   672K
System workspace       32K
               Total 4096K
```

The Tasks window. The red sliders are represented as dark grey, the green as light grey

THE TASK MANAGER

A resident piece of software called the Task Manager controls the allocation of memory to the various tasks and activities which are going on all the time whenever the Desktop is active. If you click Menu over the Task Manager icon (the A-shaped icon at the right-hand end of the icon bar), and then choose the *Task display* option, a window will appear on screen giving details of this allocation of memory (see illustration). The window is split into three sections: *Application tasks*, *Module tasks* and *System memory allocation*. It is the third of these with which this article is primarily concerned (the other sections, as the names suggest, show the amount of memory allocated to the tasks which are currently active).

Within this third section, you will see a number of items at the left-hand side of the window, each followed by a value in kilobytes, and on the right-hand side a slider bar providing a graphical representation of this value. Some of these bars are red, indicating that the value can be altered by the user, while others are green, meaning that it cannot. Those with red bars are *Screen memory*, *System heap/stack*, *Module area*, *Font cache*, *System sprites* and *RAM disc*. The default values for all these can be configured by the user (part 2 of this article next month will look at the use of the *Configure command which does this).

SCREEN MEMORY

Each screen mode requires a specific amount of memory (see Appendix F of the User Guide). Each time the Desktop is entered, the Task Manager allocates just enough memory to the screen for the currently configured Wimp mode, or the currently selected mode if the user has changed mode via the Palette menu. Note that this memory is allocated in whole pages, the size of which depends on the amount of memory in the computer - for example 8K per page on a 1 Mbyte Arc, or 32K for a 4 Mbyte machine (this applies to all memory allocation, not just screen size). So mode 12, for example, which requires 80K, will actually be allocated 96K on a 4 Mbyte Archimedes.

Altering the screen memory slider will not therefore have much effect under the Desktop, since the Task Manager automatically regulates the allocation anyway. But if you are running programs which leave the Desktop, you may find it necessary to alter the value, as the following example will illustrate. First of all, it is necessary to understand that the free memory in the computer is divided by the Task Manager into two parts, *Next* and *Free*. The Next slot is the memory available to the next application which is run, and is normally set to 640K or to the total free memory, whichever is smaller (though it can be altered by dragging the red slider). The Free slot contains any free memory which is not in the Next slot. Any memory claimed for any purpose will be taken by the Task Manager first from the Free and then from the Next slot.

Now suppose that the Task Manager is currently allocating 80K for screen memory (e.g. for mode 12), and the *Free* slot (in the *Application tasks* section of the Task display window) is showing zero. If you now run a Basic program which executes a MODE 15 statement, you will get a "Bad mode" error.

What is happening is that, when the program is run, Basic is started up and is allocated all the memory currently available in the *Next* slot. On reaching the MODE 15 statement, it will attempt to claim a further 80K from the Task Manager (mode 15 requires 160K), which the latter would normally take from the *Free* slot. But this is empty, so the claim will fail. To overcome this problem, you must drag out the screen memory slider (or indeed the Free slot slider) by a further 80K *before* running the program. This extra memory will be taken from the Next slot, and so Basic will have 80K less free memory when it starts, but there will now be sufficient to effect the mode change.

SYSTEM HEAP/STACK

This area is used by the operating system as workspace for storing certain variables and pointers etc. 32K is automatically allocated for the area at power-on, to which any configured value is added. For all practical purposes, it is not normally necessary for the user to alter the allocation (there are some rare circumstances in which it may need to be increased, but these are outside the scope of this article and you are unlikely to come across them).

MODULE AREA

The Relocatable Module Area (RMA) is primarily designed for use by modules. Modules may be programs which act as extensions to the operating system, for example to provide an additional filing system or extra * commands, or they may be applications similar to those which are installed on the icon bar. The RMA is also available for modules themselves, or any other application, to claim extra memory while running. This all happens dynamically, so the RMA will quite likely be growing and shrinking all the time you are using the computer. In practice, it tends to grow more than shrink, since memory which is returned to the RMA cannot always be re-used. From the user's point of view, it is not often necessary to alter the allocation, although sometimes if memory is tight you will find that you can drag the slider back a little to release some more.

There are also situations where you might need to increase the allocation. These are analogous to the screen memory problem mentioned earlier. For example, a Basic program may need to load a module if it needs the facilities that the module provides in order to carry out its function. Or it may need to run a transient utility, which is a small machine code program that loads into the RMA, executes and exits immediately, freeing the memory allocated to it as it does so. If Basic has already grabbed all the free memory, you will get a "No room in RMA" or "No room to run transient" error message. The solution is, as before, to allocate memory before starting Basic, in this case by dragging the module area slider.

FONT CACHE

A powerful feature of the Arc is the ability to use outline fonts. Characters in the font are stored on disc as outline data (i.e. the outlines around each letter), and when the font is used to display characters on screen, the shape and co-ordinates of each character have to be plotted for the required character size using calculations based on the outline data stored in the font file. This can take some time, so to speed things up, a section of memory can be set aside, called the *font cache*, where the calculated values for the most recently-used character sizes are kept. The larger the font cache, the more information can be kept in it, and so if you are working on a document using several fonts in a number of different sizes, it will be beneficial to have a larger font cache than if you are using just one font in one size only. It is entirely up to the user to configure the font cache to suit his own purposes. A number of articles and hints in RISC User over the past couple of years have covered the subject of outline fonts.

You can easily see the importance of the font cache by first reducing it to zero and then displaying a document on the screen which uses just a single outline font in one size. Now drag a window across the document, causing it to be redrawn, and you will see that the disc containing your fonts is continually being accessed, with a significant reduction in the redraw speed. Now increase the font cache to, say, 128K and repeat the experiment. The document should be redrawn instantaneously. There is no hard and fast rule about font cache size - you will need to experiment to find the optimum setting for your current job, and if memory is tight you may need to adjust the size from time to time while you work. Even for relatively simple DTP work, however, you should aim for at least 128K in order to keep redraws as fast as possible.

SYSTEM SPRITES

The system sprite area is largely obsolete. It was provided under the Arthur operating system as space in which programs could store sprites, but under RISC OS all applications are expected to provide their own workspace for any sprites which they use. However, there are still a few programs around which expect to find a system sprite area in existence, mostly older games and PD programs. If on running a program you get an error message saying "No sprite memory", simply drag out the slider to a value which allows the program to run (you could try 64K initially).

RAM DISC

The use of the RAM disc was covered in some detail in *Into the Arc* (Volume 4 Issue 6). There are a number of useful functions that the RAM disc can perform, such as fast copying of applications from one disc to another, and it is often underused. If you have sufficient memory but no hard disc, it is probably worthwhile having a RAM disc configured by default.

This concludes our look at the memory allocations which can be altered by the user via the Task Manager. Next month we will take a closer look at the various configuration settings which are possible on the Arc.

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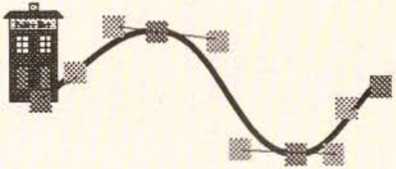

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CHRIS DRAGE Education section
BBC ACORN USER February 1991

Ace Computing

Using ANSI C

Part 5: Dialogue Boxes continued

by Lee Calcraft

In experimenting with dialogue boxes last month, we set up a dummy Search dialogue box, and implemented a short piece of code for putting it on screen. We can now use some more of the *dbox* functions to make it perform more fully.

In the first instance we will set the Case sensitivity icon according to the state of an internal flag, and will read the new value back into the flag when the user has finished with the dialogue box. We will do the same with the search string.

Our function *cd_search()*, suitably modified, appears in listing 1. The code assumes that there are two global variables defined early in the program using something like the following:

```
BOOL case_sens=FALSE;
char search_string[100]="";
```

Note that it is absolutely essential to set *search_string* to an initial value - even if this be an empty string, since attempting to use it before it has been initialised in this way could have disastrous effects. Note also that the Search template should restrict the search string to be supplied by the user to less than 100 characters - 99 would do nicely.

Listing 1. The new version of cd_search()

```
static void cd_search(void)
{
  dbox  d;       /* Dialogue box handle */
  int response;

  if (d = dbox_new("Search"), d != NULL)
  {

    dbox_setnumeric(d,1,case_sens);
    dbox_setfield(d,2,search_string);

    dbox_show(d);          /* display it */

    response=dbox_fillin(d);

    case_sens=dbox_getnumeric(d,1);
    dbox_getfield(d,2,search_string,100);

    dbox_dispose(&d);       /* remove it */
  }
}
```

The function *cd_search()* has two new lines before the dialogue box is put on screen, and two after the user has made his response, but before the dialogue box is disposed of.

The first two set fields 1 (the case sensitivity icon), and 2 (the search string), as follows:

```
dbox_setnumeric(d,1,case_sens);
dbox_setfield(d,2,search_string);
```

The second pair of new lines are as follows:

```
case_sens=dbox_getnumeric(d,1);
dbox_getfield(d,2,search_string,100);
```

Note that the last parameter of *dbox_getfield()* is the length of the buffer used to take the contents of the field.

With this code in place, the dialogue box will appear with the last used search string on display ready for editing, and with the Case sensitivity button set to its previously set state.

CONFORMING TO THE STYLE GUIDE

One very useful feature of the *dbox* suite of functions is that they have built-in conformance to a number of the RISC OS guidelines, as they appear in the *Style Guide*.

For example, if you put the Search dialogue box on screen, and press function key F2, this will toggle the Case sensitivity icon. Pressing F1 is equivalent to clicking on the "OK" button.

The effect of pressing Return is also handled for us by *dbox*: it is equivalent to clicking on the "OK" button. To make this work, the "OK" icon should be icon number zero. Moreover, if you have more than one writable icon, you should assign these in ascending numerical order from the top of the window downwards. This is because, following RISC OS guidelines, *dbox* contrives to move the caret on to the next writable icon whenever Return or Cursor Down is pressed, and to the previous one with Cursor Up. It achieves this by assuming that the icons are positioned within the dialogue box in ascending numerical order. Pressing Return on the highest numbered writable icon activates icon number zero - which is why this icon number is usually reserved for a final "OK" button.

A further RISC OS prescription is also catered for automatically. If you have a dialogue box containing no writable icons, then *dbox* will attempt to match up keyboard responses to individual action icons on display. For example, if you have two icons of button type Menu containing the words "Yes" and "No", then pressing the "y" ,(or "Y") key at the keyboard will have the same effect as clicking on the "Yes" icon - similarly, "n" or "N" will activate the "No" icon. In fact *dbox* looks for keypresses which match the first capital letter used in the icon's name. Thus in Edit, the letter "D" (rather than "R") activates the "reDo" icon. This is useful since another icon ("Replace") uses the "R" key.

RESPONDING TO dbox_fillin()

In our program so far, we have not made any use of the value returned by *dbox_fillin()* in response to the user's selection. As we mentioned last month, this useful function does not return until the user has responded to the dialogue box by closing it (using Escape, or by clicking outside the box, or on a Close icon), or by activating a field. Only icons with the following button types can be activated in this way:

Auto-repeat
Click
Release
Menu

so if you are using *dbox_fillin()*, you must ensure that all the icons that you need to respond to directly, have one of these button types. Of course, once *dbox_fillin()* returns, you can read the state of any icon using *dbox_getnumeric()* or *dbox_getfield()*. In a practical program, we would check the value returned, and react accordingly.

Even in our very simple example we ought to be responding to a returned value of -1. This implies that the dialogue box has been closed. In such cases, we would not normally update the values entered by the user. So, at the very least we ought to make the two lines immediately above *dbox_dispose()* conditional:

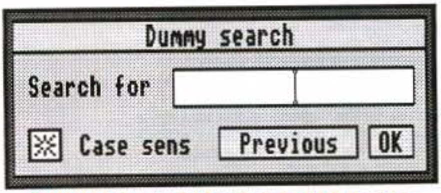
```
if (response!=-1)
{
  case_sens=dbox_getnumeric(d,1);
  dbox_getfield(d,2,search_string,100);
}
```

OPTIONALLY SUPPLYING THE PREVIOUS STRING

The Search dialogue box used by Edit does not supply the previous search string as a matter of course, but provides this as an option, implemented via an icon labelled "Previous". We can do this with our dialogue box, and at the same time, illustrate the use of *dbox_fillin()* with a *while* loop.

The new version of *cd_search()* is given in listing 2. It assumes that the Templates file "Search" has been edited to add a new icon (numbered 4), containing the word "Previous". You should give this icon the button type *Click*.

The new version of the function works by checking responses from *dbox_fillin()*. If a 4 is returned, this means that the user has clicked on "Previous" (or has hit function key F3 - which is the equivalent). In this case, we use *dbox_setfield()* to install the previous string into writable icon number 2, and we go back around the *while* loop.



Dummy Search dialogue box, with the new "Previous" icon

Only when we get a zero or -1 does the loop exit - meaning that the user had either activated the "OK" button, or had cancelled. Incidentally, it is absolutely vital that *dbox_dispose* is called once you have finished with the dialogue box. If you use a line such as:

```
if (response==-1) return;
```

you will run into difficulties, because even though the dialogue box will disappear once the user has finished with it (because *dbox_fillin()* automatically calls *dbox_hide()* when the user cancels the box), the dialogue box structure will not be removed from memory, and the same applies to the dialogue box window used for the job. Every time the dialogue box is reopened, an extra bit of RAM will be absorbed, and another window will be used up. Eventually your program will run out of memory, or you will run out of windows, and get the message "Too many windows" - so take care.

Listing 2. Version of cd_search() with option to insert previous string

```
static void cd_search(void)
{
  dbox  d;       /* Dialogue box handle */
  int response;

  if (d = dbox_new("Search"), d != NULL)
  {

    dbox_setnumeric(d,1,case_sens);

    dbox_show(d);          /* display it */
    while ((response=dbox_fillin(d))>0)
      if (response==4)
        dbox_setfield(d,2,search_string);
    if (response!=-1)
    {
      case_sens=dbox_getnumeric(d,1);
      dbox_getfield(d,2,search_string,100);
    }

    dbox_dispose(&d);      /* remove it */
  }
}
```

USING AN EVENT HANDLER

Although *dbox_fillin()* is a most useful function, there are two cases where it cannot be used. The first is where it returns insufficient information on user activity. For example, when it is necessary to respond immediately to clicks on icons of button types other than the four to which the function reacts. The second case is where you want a dialogue box to stay on screen longer than dialogue boxes controlled by *dbox_fillin()*.

In both cases, the function *dbox_fillin()* needs to be replaced by some other means of obtaining window events for the dialogue box. This is achieved by using *dbox_eventhandler()* to register an event handler function for the dialogue box, and then calling *dbox_get()* from within the event handler to find out which field gave rise to the event.

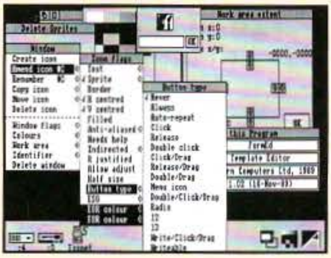
In the second case, where it was required that the dialogue box remain on screen, you would replace the function *dbox_show()* with *dbox_showstatic()*. This displays the dialogue box, and keeps it on screen until it is specifically closed. Now it will not be closed when Escape is pressed, or when the mouse is clicked outside the perimeter of the box. Of course, you would also need to make d, the pointer to our *dbox* structure, a global variable; and ensure that you do not make repeated calls to *dbox_new()* when the dialogue box is already in existence.

We will explore all this next time. RU

Unbeatable Value for RISC User Members

Wimp Programmer's Toolkit

Twelve powerful multi-tasking utilities - an essential aid to any programmer

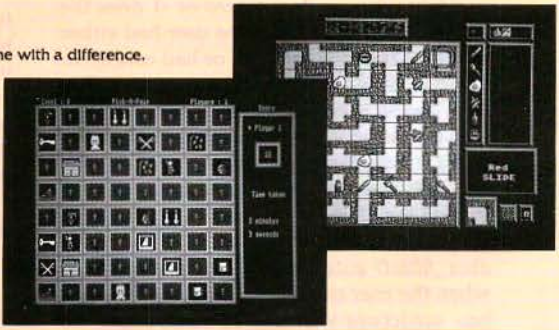


- **Wimp Debugger** allows you to debug Wimp-based programs while testing and running them.
- **EasyWimp** provides a ready-made Wimp application shell to be used for creation of single-window applications.
- **Spyglass** - displays the contents of memory allocated to any task currently running.
- **Template File Browser** - view the contents of a template file.
- **Application Shell Generator** utility for creating application directories, Obey files and their sprites.
- **Menu Editor** - create and edit Wimp menu structures for use in your own programs.
- **WimpAid** allows pointer, window and icon parameters to be dynamically displayed on screen.
- **Iconbar Shell Generator** allows you to build simple multi-tasking programs easily, by creating a shell.
- **Desktop File Loader** allows you to load a program from the Desktop, rather than run it.
- **Icon Flag Generator** calculates the value of icon flags without recourse to binary arithmetic.
- **Wimp Message Monitor** provides a means of monitoring the Wimp polling system.
- **Template Editor** - Acorn's FormEd for designing windows and icons.

ArcOmnibus

7 Original Archimedes Games

- **Amaze** - a graphically superb sliding block game with a difference.
- **Cribbage** - an excellent implementation of the well known card game.
- **Moric** - a colourful 'ladders and levels' game.
- **Ogre's Lair** - a highly entertaining arcade type game, providing hours of fun.
- **Pick a Pair** - a colourful game testing your skills of observation and memory.
- **BalloonMan** - burst the balloon - a Pacman style of game.
- **Dominoes** - a Desktop version of the classic game of dominoes.



Desktop Applications 1

A selection of 12 multi-tasking stand-alone applications

- **DataSheet** - data presentation package for creating annotated graphs
- **Calc_570** - an implementation of a scientific calculator.
- **CharDes** - character designer for creating new system fonts.
- **Diary** - a Desktop diary and calendar.
- **B_to_T** allows Basic programs to be edited without leaving the Desktop.
- **FileFind** performs a hierarchical search for a given file, application or directory.
- **SetType** - change the filetype of any file by dragging it to the icon bar.
- **HotKeys** - allows single key presses to perform a wide range of functions.
- **Mouse** - change the mouse speed merely by clicking on an icon.
- **Print** allows files to be printed just by dragging them to the icon bar.
- **NotePad** provides for up to eight pages of jottings.
- **Dustbin** - sits on the icon bar and allows files to be deleted by simply dragging them to its icon.

	Members' Price	Normal Price	
Wimp Programmer's Toolkit disc and documentation	£14.95	£19.95	Stock Code **PWPTa**
Desktop Applications disc and documentation	£ 9.95	£14.90	Stock Code **PDA1a**
RISC User Volume Three Special Disc and documentation	£ 9.95	£14.90	Stock Code **1406a**
ArcOmnibus Games disc and documentation	£ 9.95	£14.90	Stock Code **PAOMa**

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- **Keystrip Generator** (both 9- and 24- pin matrix printer versions)
- **Encode** - a file encryption utility
- **CMOS RAM Manager**
- **Amaze** - a graphically superb and entertaining game
- Some of the best **Maestro** music files
- **Watchdog Anti-Virus** - protect your hard and floppy discs from viruses
- **Ovation Clip-art** - from Beebug's highly successful DTP package Ovation
- **Application Shell Generator** for creating application directories, sprites and !Run files.
- **Advanced Desktop Presentation Creator** - screen display with a choice of different fades
- A complete set of **ArcScan** index data for RISC User Magazine Volume 3

File Handling for All

Book

by David Spencer and Mike Williams

File Handling for All is a comprehensive book which covers all the requirements of data storage and processing by computer, using the popular BBC Basic programming language for the examples. It is aimed at anybody interested in File Handling and Databases, whether beginners or more advanced users, and will appeal to all who want to learn more of this important subject.

The book starts with an introduction to the rudiments of file handling, and in the following chapters develops an in-depth look at the different types of files e.g. serial files, indexed files, direct access files, and searching and sorting. A separate chapter is devoted to hierarchical and relational database design, and the book concludes with practical advice on developing file handling programs.

The associated disc (£4.75) contains complete working programs based on the routines described in the book and a copy of Filer, a full-feature Database program.

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ArcScan III

An all-purpose reference finder for books, magazines and manuals

Contains the following Databases:

- RISC User Volumes 1, 2 3
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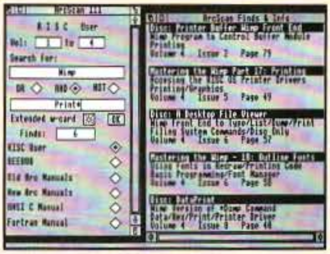
Indexes to the following Archimedes manuals:

- RISC OS Programmer's Reference Manual
- ANSI C Manual (Release 3)
- BBC Basic Guide
- RISC OS User Guide



Disc: Printer Buffer Wimp Front End
Wimp Program to Control Buffer Module
Printing
Volume 4 Issue 2 Page 75

Mastering the Wimp Part 17: Printing
Accessing the RISC OS Printer Drivers
Printing/Graphics
Volume 4 Issue 5 Page 49

Disc: A Desktop File Viewer
Wimp Front End to Type/List/Dump/Print
Filing System Commands/Disc Only
Volume 4 Issue 6 Page 57

Mastering the Wimp - 18: Outline Fonts
Using Fonts in Redraw/Printing Code
Basic Programming/Font Manager
Volume 4 Issue 6 Page 58

Disc: DataPrint
Wimp Version of *Dump Command
Data/Hex/Print/Printer Driver
Volume 4 Issue 8 Page 48

ArcScan III features:

- flexible keyboard search on any entry
- improved search logic - choice of 3 logical operators: OR, AND and NOT
- new extended wildcard option
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Disc supporting the book	£ 4.75	£ 4.75	Stock Code **BKO3a**
File Handling for All book and disc	£11.95	-	Stock Code **BKO2b**
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Hints & Tips. . . Hints & Tips

WIMP MENU WIDTHS

Rolf Herschel

When designing menus, a sensible value for the menu item width (at *menublock*+16), is as follows:

```
(LEN(maxitem$)+1)*16
```

where *maxitem$* is the longest item on the menu. However, if the menu title is several characters longer than the longest item, you should use the length of the title to work out the width. If you do not do so, then any submenu arrow pointers may be positioned too far to the left. The result of this will be that, when you move the pointer over the arrow, the submenu will be displayed initially, but as you move the pointer further towards the submenu it will re-enter what the Wimp sees as the main body of the menu, and the submenu will disappear before you can make any selection from it.

PERMANENT DIALOGUE BOXES

Richard Bates

There appears to be a bug in the Window Manager which allows you to keep dialogue boxes permanently on the screen. To see this in action, try the following example: display a Save dialogue box (e.g. from the Palette menu), and hold down Select over the title bar of the box while pressing Escape, but do not release Select. The menu will disappear. Keeping Select pressed, move the mouse, and the dialogue box will reappear and will remain permanently on screen.

This will not work with programs which use the C library, as they will suffer a fatal crash. You should also be warned that keeping open a dialogue box which has been closed is not an intended feature of RISC OS, and it may result in the Desktop crashing.

We understand that this bug will be corrected in later versions of the Window Manager.

UNHANGING PROGRAMS

Matthew Astley

When developing programs, they can sometimes crash and hang the computer, requiring a reset to restore operation of the machine. If IRQs are enabled while the computer is hung (i.e. if pressing the Caps Lock key will turn the light on and off), you can "unhang" it by using the following call before running the program:

```
SYS "OS_CallAfter",1000,0
```

This will cause a "Branch though zero" error 10 seconds (i.e. 1000 centiseconds) after the call is executed. You can alter the period by changing the number of centiseconds specified in R0. You could either enter the command at the keyboard before running the program, or include the line in the program itself, making sure in either case that the delay is sufficient for the program to reach the point where it hangs before the timer runs out. You are then in a much better position to debug the faulty program.

TEMPLATE IDENTIFIERS

Alan Wrigley

A point which is easily overlooked when using Wimp_LoadTemplate is that the pointer to the template name in R5 *must* point to a word-aligned block of 12 bytes. In other words, you should use some code along the following lines:

```
DIM name% 11
$name%=identifier$
SYS "Wimp_LoadTemplate",,block%,ind%,
-1,name%,0
```

If you do not do this, you may find that strange things happen to your program, particularly if you are using template names less than 4 bytes long.

HOURGLASS CONTROL

Andrew Gordon

The following procedure controls the use of the hourglass. It takes 1 parameter, val, which specifies the action taken. A value from 1 to 99 will turn on the hourglass and display *val* as the percentage below it. Passing TRUE (-1) to the procedure will turn the hourglass on only. Passing FALSE (0) or 100 will turn the hourglass off regardless of how many times it has been turned on.

```
DEFPROChourglass(val)
IF val=0 OR val=100 THEN
SYS "Hourglass_Smash"
ELSE
SYS "Hourglass_On"
```

```
   IF val>0 AND val<100 SYS "Hourglass_
Percentage",val
   ENDIF
   ENDPROC
```

SCRAP FILES

K.J. Bracey

If you use floppy discs, you will probably be annoyed by repeated prompts to insert the disc containing your !System directory when transferring data between applications. The reason for this is that some applications cannot transfer data in memory, so they do it via a temporary disc file, pointed to by the system variable *Wimp$Scrap*, which by default is inside !System. However, the file can be anywhere, and by using the RAM disc instead you can save all that tedious swapping. To do this, insert the following command into your boot sequence:

```
Set Wimp$Scrap RAM:$.ScrapFile
```

The printer drivers also use similar scrap files, which can again be redirected via the RAM disc with the following lines:

```
Set Printer$Scrap RAM:$.!PScrap
Set Printer$Temp RAM:$.!PTemp
```

You should of course make sure that you have a RAM disc of sufficient size configured.

Alan Wrigley adds: This method can also be useful for hard disc users when transferring a lot of data between applications. One example would be when viewing archived clip art files using, say, Sparkplug to unpack the files and transfer them to Paint or Draw. If you have enough memory, it is worthwhile configuring a large RAM disc and dragging the entire archive into it before you start.

IMPROVED CIRCULAR TEXT WITH FontFX

Ben Avison

When using FontFX, if you select *Circle* and the two-way direction icon, you are not usually given any control over where your text is split between the upper and lower sections. For example, "RISC USER FOR THE ARCHIMEDES" is split into "RISC USER FOR" and "THE ARCHIMEDES", which does not read very well. There is a solution, however, provided you are happy to use the *Replace spaces with dots* option.

This is done by introducing a "middle dot" character (ASCII 183), which FontFX treats as a hard space. This can be inserted by holding down the Alt key while typing 183 at the numeric keypad. So if you type "RISC USER FOR.THE ARCHIMEDES", FontFX will not recognise the dot as a space, and the string will be split up as "RISC USER" and "FOR THE ARCHIMEDES". Selecting *Replace spaces with dots* then fills the other spaces with dots as well, so the whole image looks consistent.

IMPROVED PC EMULATOR CHARACTERS

Peter Bready

If, like me, you are not overly fond of the chunky IBM character set in the PC Emulator, the following few lines of Basic will modify the Emulator ROM file with the BBC font of your choice. Line 20 should be altered so that R$ includes the pathname of your own emulator, and line 50 should contain the pathname of the required font file (type &FF7). You should save a copy of your original ROM file before making the alterations.

```
   10  DIM rom% &2000:offset%=&166E
   20  R$="adfs::HardDisc4.$.!PC.ROM"
   30  OSCLI"Load "+R$+" "+STR$~rom%
   40  A%=OPENIN(R$):r1%=EXT#A%:CLOSE#A%
   50  F%=OPENIN("NewFont")
   60  REPEAT:B%=BGET#F%
   70  IF B%<>23 PRINT "Not a BBC font
file":CLOSE#F%:END
   80  B%=BGET#F%:FOR I%=0 TO 7
   90  rom%?(offset%+((B%+128)MOD256)*8
+I%)=BGET#F%
   100 NEXT:UNTIL EOF#F%
   110 CLOSE#F%
   120 OSCLI"Save "+R$+" "+STR$~rom%+" +"
+STR$~r1%
```

I have used the program successfully on the ROM files with versions 1.33 and 1.60 of the PC Emulator.

CalcSheet

The new spreadsheet for the Archimedes

Main features

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Technical Queries

Dear Sir

I am experiencing a problem with your Printer Buffer (Volume 4 Issue 2). If the buffer is installed, followed by Minerva's MultiStore, then any subsequent attempt to move files or directories around the Desktop causes a stream of writing to be created in a ribbon following the mouse movement.

Robin Hampshire

The problem you are having is due to a clash between the Printer Buffer and MultiStore over SWI numbers. SWI numbers can be in the range 0 - &FFFFFF. Not all of these are available to RISC OS, and Acorn has split those that are into four ranges as follows:

0 - &3FFFF	Operating system
&40000 - &7FFFF	Operating system extension modules
&80000 - &BFFFF	Third party applications
&C0000 - &FFFFF	User applications

Producers of commercial third party applications which require SWI calls of their own should apply for an allocation of a SWI chunk (a block of 64 consecutive SWIs) in the third range above, while users who are writing their own applications are able to use the last range for their SWI calls. RISC User magazine disc software falls into this latter category, since it is not full commercial software. This does mean, unfortunately, that there are occasionally clashes between such programs and other similar software. However, MultiStore is a major software application, and Minerva should have used SWIs in the third party application area rather than the user area. Because both MultiStore and the Printer Buffer have chosen to use SWIs starting at &C0000, clashes will occur when both are installed together, as you have found.

The short-term solution is simple - just alter line 300 of the buffer source program by replacing &C0000 with &C0100 or some other number in the specified range which is a multiple of &40. Then reassemble the buffer module.

When writing your own programs, try to choose a number which is not so obvious - perhaps &D2140 or &FE080 for example.

Dear Sir

I am puzzled by the fact that sometimes when I double-click on a sprite file, Paint is loaded as I would expect, while other times all that happens is that a small sprite appears in the bottom left-hand corner of the screen.

Eve Gray

The difference depends on whether Paint has previously been "seen" by the Filer in a directory window. The default action for sprite files when you switch on your Archimedes is to perform a *Screenload command on the file if the user double-clicks on it. This command simply displays the first sprite in the file on the screen, using the bottom left-hand corner as the origin. It was used under the Arthur operating system for loading screens saved as large sprites. The sprite will be plotted at its correct size, so if you double-click on, say, an application's !Sprites file, the first sprite is likely to be the sprite which represents the application in a viewer and on the icon bar. This is normally 34x17 pixels in size, so you will see a 34x17 pixel sprite appear at the corner of the screen.

However, when Paint is first seen by the Filer, its !Boot file is automatically run. In this file is a command which alters the run action for sprite files (i.e. the action which is taken when a user double-clicks on the file) to load the file into Paint, installing Paint first if it is not already on the icon bar. In other words, if you want sprite files always to be loaded into Paint, ensure that a directory viewer containing Paint has been seen before you double-click on the files. RU

ARE YOU GOOD ENOUGH?

As the leaders in software for the Archimedes range of computers, CLARES MICRO SUPPLIES are looking to extend our range even further. We are looking for people who are as excited by the Archimedes as we are.

If you have written any programs, completed or not, then we would like to hear from you.

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Programs can be written in any language as long as they perform their stated task. Many of our programs contain large chunks of BASIC with ARM code in the areas that it is needed. BASIC on the Archimedes is a very powerful language and we do not attach any snob value to its use. If your program does what is meant to do then thats all we are interested in. Why not join the top team on the Archimedes. You get the support of our in-house team, privileged access through us to Acorn and invitations to our informal programmers seminars.

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Postbag Postbag

MORE SUPPORT FOR SCIENTIFIC SOFTWARE

I would like to echo Dr.R.H.Cumming's letter (RISC User Postbag, Volume 4 Issue 8) concerning the lack of serious scientific software for the Archimedes, particularly statistical/graphing packages in a similar class to Cricket Graph on the Apple Macintosh, and Harvard Graphics on PCs.

I have been using the Arc to process experimental data for some time using a spreadsheet, with the final data imported into Minerva's GraphBox for plotting. GraphBox has no statistical functions and despite modifications to the early versions, still has many limitations to its use in the scientific field. There is limited control over axes presentation, logarithmic graphing is rudimentary, and axis numbering is sparse and tends to overwrite itself.

There is no facility to annotate the 'y' axis in the traditional fashion (vertically) and fancy fonts are not catered for. However, the ability to import the graph into Draw is one of the package's great strengths, and with a bit of hard work allows other deficiencies to be overcome.

I have had an opportunity to evaluate a copy of First from Serious Statistical Software. This offers some very powerful statistical features, though it doesn't operate in the Desktop environment which I feel is a disadvantage. In your reply to Dr.Cumming's letter you suggested that numerical applications are seen as difficult with a smaller specialised market, though surely such statistical packages would find a ready market in the educational field as well as the scientific community. There is now an abundance of document processors/DTP packages for the Arc. Perhaps software houses will now realise that this market is saturated and put equal effort into filling the hole in the market for a comprehensive graph/stats package.

Dr.T.P.Dawson

DOING TIME DOWN UNDER

The Worldwide Time application in RISC User Volume 4 Issue 9 is no doubt very handy for our far flung relatives in the UK but I'm afraid it won't do for us!

The trouble is that it takes its base time from the system clock, working on the assumption that local time is the same as GMT give or take an hour in summer). My machine is configured for GMT+10. Rewriting the time differences in the Locations file is tedious and doesn't solve the problem anyway - basing them on noon here would put New York, say, into negative time.

Adding the following lines rectifies the matter:

```
  95 zone%=10:REM local variation +/- GMT
 305 PROCgmt_from_local(-zone%)
1675 PROCgmt_from_local(-zone%)
2310 DEF PROCgmt_from_local(inc%)
2320 A%=!t_uk%:B%=A%+inc%*360000:C%=t_uk%?4
2330 IF inc%>0 AND (A%>>>1)>(B%>>>1) C%+=1
2340 IF inc%<0 AND (A%>>>1)>(B%>>>1)C%-=1
2350 !t_uk%=B%:t_uk%?4=C%
2360 ENDPROC
```

A second problem stems from the different dates for summer time used in different countries. It would be useful to set summer time separately on each of the panels, but this is a bit more tricky. Perhaps you would ask the author if he can supply an upgrade.

Patrick Dowling
New South Wales, Australia

Our thanks to Patrick Dowling for these useful additions. If you want to use the modifications outside Australia, just set the value of zone% in line 95 to the number of hours by which you are ahead of GMT (negative if you are behind).

· POINTS ARISING · POINTS ARISING · POINTS ARISING ·

Run_Apps & See_Apps
(Volume 4 Issue 8)

A small but fatal error crept into both these applications (including the magazine disc versions). To alter See_Apps, add the line:

```
Set SeeApps$Dir <Obey$Dir>
```

to the !Boot file just before the IconSprites line. Then change line 100 of !RunImage to:

```
100 path$="<SeeApps$Dir>"
```

Do the same for Run_Apps, but use RunApps$Dir instead of SeeApps$Dir in each case. Updated copies of these applications are included on this month's magazine disc.

Double you

A new utility that provides completely transparent file compression and decompression. Compatible with ADFS, SCSIFS, IDEFS, and NFS allowing all file operations to occur as normal, except that it compresses the data as it is written to disc, and decompresses it again when read back. It uses LZW adaptive compression that adapts itself to the type of data so that, on average, this can achieve compression of 2 or 3 to one for most types of data - in other words, you can fit twice as much data on your disc, hard or floppy, as you would normally!

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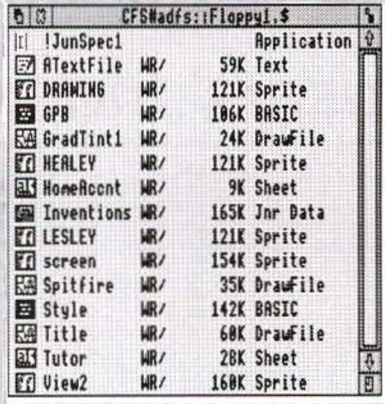
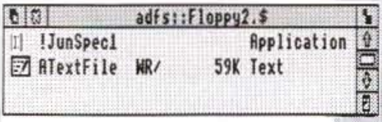


```
CFS#adfs::Floppy1.$
!JunSpec1                  Application
ATextFile   WR/        59K Text
DRAWING     WR/       121K Sprite
GPB         WR/       106K BASIC
GradTint1   WR/        24K DrawFile
HEALEY      WR/       121K Sprite
HomeAccnt   WR/         9K Sheet
Inventions  WR/       165K Jnr Data
LESLEY      WR/       121K Sprite
screen      WR/       154K Sprite
Spitfire    WR/        35K DrawFile
Style       WR/       142K BASIC
Title       WR/        60K DrawFile
Tutor       WR/        20K Sheet
View2       WR/       160K Sprite
```



```
adfs::Floppy2.$
!JunSpec1                Application
ATextFile  WR/     59K Text
```

The floppy disc on the left holds 2 files totalling 757,502 bytes.
Using Compression, the floppy disc on the right holds 15 files totalling 2,032,669 bytes.

for the Archimedes

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Archimedes 310 colour system & 4Mb RAM, 40Mb hard disc, RAM/ROM card with 96k battery backed RAM, Acorn C Compiler release 3, Programmers Reference manuals, Epson RX80 printer £1000. Tel. (0258) 480739.

SWAP: In exchange for a Video Digitiser, I own a BEEBUG A6 Scanner V1.03. FOR SALE: E-Type, E-Type Designer, Arcendium and Olympics £5 each, also Powerband and Conqueror £8 each, Voltmace Deltacat joystick £10, Watford 2 layer 4 slot backplane £15, Monitor swivel base £4, if you wish to buy all, £60. Tel. 061-445 3369 after 6pm, buyer collects or pays postage.

Taxan Viking II monitor £500, Informix 4GL discs £90, Acorn 12" mono monitor £40, Cumana CDX400 40T dual disc drives £50, Master 65C102 co-processor £60, Acorn 1770 DFS ROM £10, BBC graphics ROM £10, A3000 User Port/Midi expansion card £40, View Professional £30, HCCS 20Mb SCSI drive £175, new Western Digital 20Mb ST506 drive £125, BBC Linear Graphics scanner Mk1 £30, Archimedes Interword ROM £20, BBC Plotmate adaptor £10, A2-128 Concept Keyboard £55, A3-128 Concept Keyboard £50 and KXP1080 9 pin printer £80. Tel. (04867) 80632 for further details.

A3000 computer with learning curve package, Epson LQ400 printer, Sigmasheet spreadsheet, childrens games £760. Tel. (0442) 64520.

Archimedes 310 with RISC OS, B/W monitor and Taxan Kaga printer, programs including 1st Word Plus, Clares Artisan, Repton 3 and Quazer, also extra discs £500 o.n.o. Tel. (0223) 242993 eves.

A3000 2Mb memory upgrade board £40, excellent condition, selling because of upgrade. Tel. (0788) 521189.

Games: Nevryon £9, E-Type Designer £9, Alien Invasion £4 and also a number of games for the BBC/Electron, so please ring for details. Tel. (0624) 833158 or 832434.

A3000 owner wants other users to exchange hints, ideas, PD and software, large PD selection held. Write to; Mr D Burnett, 135 Park Road, Enfield, Middlesex EN3 6LN.

E-Type (racing car game) from 4th Dimension, original box, discs and instructions £10, AcrOmnibus, 7 original Archimedes games from BEEBUG £5. Tel. 081-654 3733.

WANTED: Contact with anyone who has an Arc version of Folio and/or Fortell financial software from Micro Investor (now disappeared). Tel. (0932) 346331.

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Norwich Computer Services	*34*
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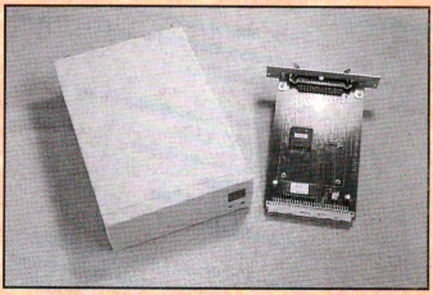
IDE Hard Disc Upgrades

for the Archimedes & A3000

A revolution in hard disc expansion

What is IDE?

IDE (Integrated Drive Electronics) is the latest interface standard for connecting hard disc drives to personal computers. Unlike previous interfaces it incorporates much of the circuitry on to the drive itself, greatly simplifying the interface electronics.



How fast is IDE?

The IDE interface uses a full sixteen bit data bus that allows very high transfer rates between the drive and computer. This coupled with cache memory on the drive itself provides for an Archimedes hard disc system that is typically 50% faster than the standard Acorn ST506 hard disc interface.

What drive options are available?

Archimedes 310, 440, 400/1 and 540.

Drive sizes currently available are 42, 89 and 105 Mbyte with a typical access time of 28ms for the 42Mb models and less than 20ms for the others.
These 3.5" drives are available as either internal or external units, and use our high speed 16 bit IDE interface card that fits in your podule backplane. External drives are attractively boxed with their own internal power supply and fan. You may even use both an internal and external drive from the same interface if required.

A3000

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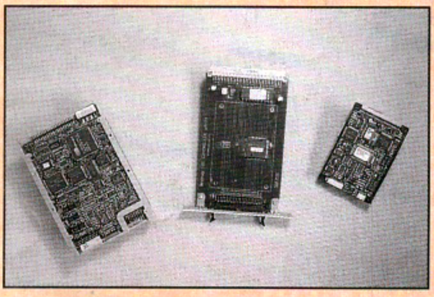

Will my existing software work with IDE?

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Can I add additional drives at a later date?

The IDE interface can support two hard disc drives. Typically, one of these would be fitted internally, and the second unit connected externally via the expansion connector provided on each interface card.

What does the future hold?

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